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AGO CIRCLE BULLETIN

UNDERGRADUATE STUDY 1973-1974
UNIVERSITY OF ILLINOIS AT CHICAGO CIRCLE

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The University of Illinois at Chicago Circle

Undergraduate Study

1973-1974

This publication is a record of the 1972-1973 academic year and an announcement of the 1973-1974 academic year.

CHICAGO CIRCLE BULLETIN

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Academic Calendar

1973-1974

Chicago Circle

Fall Quarter	
September 17-21, M-F	Registration
September 24, M	Instruction begins
November 12, M	Veterans Day (holiday)
November 22-23, Th-F	Thanksgiving vacation
November 30, F	Instruction ends
December 3-7, M-F	Final examinations
Winter Quarter	
December 10-14, M-F	Registration
January 2, W	Instruction begins
February 12, Tu	Lincoln's Birthday (holiday)
March 8, F	Instruction ends
March 11-15, M-F	Final examinations
Spring Quarter	
March 18-22, M-F	Registration
March 25, M	Instruction begins
April 12, F	Good Friday (holiday)
May 27, M	Memorial Day (holiday)
May 31, F	Instruction ends
June 3-7, M-F	Final examinations
June 9, Su	Commencement
Summer Quarter	
June 10-14, M-F	Registration
June 17, M	Instruction begins
July 4, Th	Independence Day (holiday)
August 23, F	Instruction ends
August 26-30, M-F	Final examinations

Urbana-Champaign

First Semester	
August 23-25, Th-Sat	Registration
August 27, M	Instruction begins
September 3, M	Labor Day (holiday)
Novemer 12, M	Veterans Day (holiday)
November 20-26, Tu-M	Thanksgiving vacation
December 14, F	Last day of instruction
December 15-22, Sat-Sat	Final examinations
Second Semester	
January 17-19, Th-Sat	Registration
January 21, M	Instruction begins
March 16-24, Sat-Su	Spring vacation
April 19, F	Honors Day
May 10, F	Last day of instruction
May 11-18, Sat-Sat	Final examinations
May 25, Sat	Commencement
Summer Session	
June 10, 11, M, Tu	Registration
June 12, W	Instruction begins
July 4, Th	Independence Day (holiday)
July 8, M	Beginning of second four-week courses
August 1, Th	Last day of instruction
August 2, 3, F, Sat	Final examinations

1974-1975

Chicago Circle

Fall Quarter	
September 17-19, Tu-Thu	Registration
September 23, M	Instruction begins
November 11, M	Veterans Day (no classes)
November 27, W	Instruction ends
November 28, 29, Thu, F	Thanksgiving (no classes)
December 2-6, M-F	Examinations
Winter Quarter	
December 17-19, Tu-Thu	Registration
January 6, M	Instruction begins
February 17, M	President's Day (no classes)
March 14, F	Instruction ends
March 17-21, M-F	Examinations
Spring Quarter	
March 25-27, Tu-Thu	Registration
March 28, F	Good Friday (holiday-offices closed)
March 31, M	Instruction begins
May 26, M	Memorial Day (no classes)
June 6, F	Instruction ends
June 9-13, M-F	Examinations
June 15, Su	Commencement
Summer Quarter	
June 17-19, Tu-Thu	Registration
June 23, M	Instruction begins
July 4, F	Independence Day (no classes)
August 29, F	Instruction ends
September 1, M	Labor Day (holiday-offices closed)
September 2-5, Tu-F	Examinations

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Perspective

On February 22, 1965, the University of Illinois at Chicago Circle opened its doors at its permanent location, which takes its name from the nearby transportation interchange symbolic of the flow of people within the urban region.

The move from Navy Pier, site of the University's Chicago Undergraduate Division for nineteen years, signaled the emergence of the principal public university at the service of—and in the midst of—the state's major population center.

Just as the physical growth of the University of Illinois at Chicago Circle was designed to answer the emphatically stated educational needs of the area's citizens, so have the instruction, research, and public service programs been organized and are regularly reviewed and improved to meet these expressed needs.

One of the historic qualities of the University of Illinois is its ability to integrate the research and public service activities of its faculty, staff, and student body with its educational programs. In the setting of Chicago Circle this capability points to professional fields and disciplines that have high impact upon urban life while maintaining a commitment to a wide range of programs fundamental to the development of special inquiry.

With approximately 20,000 students enrolled, the University of Illinois at Chicago Circle offers degree programs in the following colleges and schools:

College of Architecture and Art
College of Business Administration
College of Education
College of Engineering
College of Liberal Arts and Sciences
College of Urban Sciences
Jane Addams School of Social Work
School of Physical Education

From these colleges and schools flow the instructional lines that have been proven in many different settings to be the essentials of sound educational programs. Within these programs are areas of stress and emphasis relevant to students who emerge from a basically urban environment and who are likely to live out their lives within it.

Graduate work at the master's and doctoral levels is offered in twenty-two disciplines. These programs are described in Graduate Study, the catalog of the Graduate College. New undergraduate and graduate programs will be introduced in the next several years, and the entering student should be attentive to announcements as they are published.

The new College of Urban Sciences provides a focus for interdisciplinary programs and activities relating to the problems and needs of urban areas, with special emphasis on metropolitan Chicago. The first degree offering of the College, the Master of Urban Planning and Policy, will begin in September, 1973. Details of the program and further information about the College of Urban Sciences will be found in Graduate Study.

The Chicago Circle Campus is located just south and west of the Loop in an area bounded by the Eisenhower and Ryan Expressways, Racine Avenue, and Roosevelt Road. The mailing address is Box 4348, Chicago, Illinois 60680. Transportation to the campus is by way of the Congress and Douglas Park trains of the CTA, which has built a subway station at Peoria Street especially to serve Chicago Circle, and by the buses on Halsted, Harrison, and Taylor Streets and on Roosevelt Road.

Other University of Illinois Facilities in Chicago include the Colleges of Medicine (including the School of Associated Medical Sciences), Dentistry, Nursing, and Pharmacy and the Health Sciences Division of the Graduate College that are located in the West Side Medical Center.

Information may be obtained from the University of Illinois at the Medical Center, 1737 W. Polk Street, Chicago, Illinois 60612, or by calling 996-7000.

The Library

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The Library of the University of Illinois at Chicago Circle, consisting of the Main Library and the divisional Mathematics and Science Libraries, affords resources for students in all curricular areas and provides constantly growing collections of materials for current and projected graduate programs and for faculty research.

The Library building seats 2,800 people and has a book capacity of 500,000 volumes. As of July, 1972, Library holdings included more than 480,000 books and bound periodicals, 191,000 government documents, 72,000 maps, and an extensive and expanding collection of microform materials. Currently, the Library receives more than 7,000 periodical titles. Students have full access to books and other materials shelved on open stacks. Leaflets describing library services, rules, and regulations within each department are available throughout the Library.

The Main Library

All books, journals, and periodicals except those in the fields of biology, chemistry, geology, and physics are housed in the Main Library. The building also houses the Administrative Offices, Technical Services, Collections Development, and the Public Services Division. The latter division includes the Audio Center, the Circulation Desk, the Curriculum Library, the Documents Section, the Interlibrary Loan Office, the Periodicals and Microforms Desk, the Reference Desk, the Reserve Book Desk, and the Special Collections Department.

The reference collection includes encyclopedias, handbooks, indexes, bibliographies, and specialized reference tools. Reference librarians are available at the Reference Desk between 8 a.m. and 5 p.m. Monday through Friday, and 9 a.m. to 5 p.m. Saturday to assist faculty and students. The microforms collection contains more than 232,000 items of microfilm, microcard, and microfiche, and the necessary reading and duplicating equipment. Assistance in the use and borrowing of microforms and periodicals is available at the Periodical-Microforms Desk. Phonodiscs, tapes, listening rooms, and listening equipment are available in the Audio Center. The Documents Section houses United States, United Nations, and Illinois state and municipal documents and provides reference service for these materials.

The Special Collections Department administers Chicago Circle's collections of rare books, maps, archives, and manuscripts. The Map Section contains government depository collections of U.S. Geological Survey and U.S. Army maps and other political, physical, and economic maps.

The Science Library

Located on the third floor of Science and Engineering South, the Science Library houses monographs and periodicals in biology, chemistry, geology, and physics and selected monographs in science-related and general reference classes. Also available are abstracts and indexes covering the pure sciences, selected government documents, and reserve materials for 300-and-higher-level courses. Circulation policies and procedures, Science Library hours, and special services offered are outlined in printouts available in the Science Library.

The Mathematics Library

Located on the fourth floor of Science and Engineering Offices, the Mathematics Library houses mathematics monographs and selected monographs in mathematics-related subjects, complete runs of periodicals in mathematics and mathematics education, abstracts and index journals covering mathematics periodicals, selected government documents used more frequently by mathematics than non-mathematics patrons, and reserve materials for 300- and 400-level courses in mathematics and mathematics education.

The Computer Center

Recognizing that large-scale electronic computers are now in widespread use as a research tool in nearly all scholarly disciplines, the University has established a Computer Center that is charged with administering a facility to meet its educational and research needs.

The present equipment at the Computer Center includes an IBM 370 Model 155 computer with 1,048,576 bytes of core storage. As part of this facility there is also an extensive conversational time-sharing system with typewriter consoles located throughout the campus. The Center also operates an IBM 1800 process control computer with 32,768 words of 2 microsecond core storage.

The staff members of the Computer Center teach courses in programming and numerical analysis in cooperation with the Department of Mathematics and the College of Engineering. The staff also assists other departments in utilizing the equipment for both teaching and research throughout the campus.

The Office of Instructional Resources (OIR)

A comprehensive and coordinated media service is offered by this office to assist faculty members in using instructional technology in the classroom. It provides these services through consultative divisions—Course Development and Programmed Instruction—and operational divisions—Campus Services, Film Availability Center, Instructional Materials Production, Film Making, Television Production, and Television Engineering. The Office also provides media support for administrative functions, community organizations, campus groups, professional meetings, student activities, academic courses in broadcasting, and Chicago Circle Broadcasting, a student organization.

Programmed Instruction helps to locate and try out programmed materials applicable to courses at Chicago Circle and aids in the development of programmed materials that faculty and supporting staff produce. *Course Development* analyzes instructional tasks and assists the faculty in stating objectives, designing measuring instruments, planning instructional sequences, and validating instructional effectiveness.

Campus Services loans audiovisual equipment to faculty and staff for classroom and other University functions. The *Film Availability Center* arranges rental or purchase of commercial films and filmstrips and maintains the OIR film collection. In its graphic arts studio and photographic laboratory, the *Instructional Materials Production Division* produces artwork, visual aids, and camera-ready materials for publications. *Film Making* produces academic films to explore their potential for innovative and effective use. *Television Production* produces and distributes televised lessons for courses and videotape-teaching presentations, campus events, and interviews. *Television Engineering* supports the work of all OIR divisions, designs systems to meet departmental program requirements, and maintains the OIR closed-circuit television system.

Student Handbook and *UICC Student*

Each incoming student receives a copy of the Student Handbook, which provides information about the University. The student has a personal obligation to familiarize himself with its contents and with the customs and policies of this campus. Enrolled students may obtain copies from the Office of Student Affairs.

In addition to the Student Handbook, each student is expected to obtain and read the *UICC Student*—the official student newsletter of the University of Illinois at Chicago Circle. Official bulletins, announcements, policy changes, and other helpful information are published in the *UICC Student.* All issues will be available in distribution bins throughout the campus. Back issues are available in Room 809, University Hall.

Research Centers

The Center for Research in Criminal Justice

Hans W. Mattick, M.A., Director

The Center is a research unit associated with the Department of Criminal Justice in the College of Liberal Arts and Sciences. It consists of a small core staff that conducts, supports, and supervises criminological research projects. The Center's orientation is empirical and emphasizes two kinds of research: (1) experimental-evaluation-performance research, designed to test hypotheses with data; and (2) descriptive-process-historical research, designed to determine the structure and functions of crime-related organizations and activities. The Center applies both qualitative and quantitative methods to the research problems of the criminal justice system.

The Academic Year

The academic year consists of three quarters (Chicago Circle and Medical Center) or two semesters (Urbana). Requirements are generally stated in terms of full-time programs.

Commuter Services

Lockers

Any student or faculty member may claim, and attach his own lock to, any unoccupied locker (available in most classroom buildings) during the academic year. However, contents and lock must be removed when the occupant leaves the University, or not later than the end of summer quarter. The University is not responsible for contents, theft, or loss.

Parking

These facilities are limited. University parking lots are self-sustaining; hence, there is no free parking.

There are two types of parking facilities: key card lots at $25 per quarter and daily fee lots at $1 per entry.

Parking fees are subject to periodic review and change.

Circle Children's Center

A full-time day care facility is available to the children of the University of Illinois students, faculty, and staff. Children must be between the ages of two and six and toilet trained. For full-time care, the cost is $15 per week; part-time costs vary. Call 996-8663 for additional information and application forms.

Housing

The University of Illinois at Chicago Circle was established to serve the needs of students who can travel daily to and from the campus. It is assumed that most students will be living at home with their families or, if minors, in accommodations of which their parents would approve. There are many facilities in the Chicago area that offer activities and supervision similar to those of a residence hall, for example, the Eleanor Clubs (for women), the YWCA, and the YMCA. Whether students live in these facilities or in others is a matter of personal responsibility and/or of agreement between students and their parents.

The Auxiliary Services Office of the University of Illinois at Chicago Circle assists faculty, staff, and students in finding housing by maintaining a file of available rooms and apartments for rent and houses for rent or sale. This listing service is available Monday through Friday, from 8:30 a.m. to 4:45 p.m. in Room 704 of the Chicago Circle Center. Telephone 996-5058. Landlords are responsible only for a pledge of nondiscrimination on the grounds of race, religion, or national origin. A listing is removed when there is evidence that the pledge has been violated. However, the University does not inspect the premises nor verify the accuracy of the statments made by the owners at the time of the referral.

Persons seeking a roommate, with or without an apartment, are urged to post a notice on the Auxiliary Services bulletin board on the seventh floor of Chicago Circle Center. A form for this purpose, which includes a nondiscrimination pledge that must be signed by the landlord, may be obtained in Room 704 and must be completed before the notice may be posted.

Special University Programs, Opportunities, and Activities

English Resource Center

The English Resource Center, sponsored and operated by the Department of English, provides tutorial service and individualized instruction for students who wish to improve or reinforce their composition skills. Tutors diagnose writing problems and suggest ways for a student to overcome a deficiency that may impede his academic performance. Students in the freshman composition program may seek individualized help in solving those writing problems that cannot be dealt with in the composition classes. The facility also affords an opportunity for undergraduate English-education majors and graduate teaching assistants to gain professional experience at the Center, located in Addams Hall and open from 9 a.m. to 4 p.m., Monday through Friday.

Educational Assistance Program

The Educational Assistance Program was created in 1968 in an effort to admit to Chicago Circle a limited number of inner-city residents who would normally not be eligible for attendance at the University. These students often encounter academic or financial situations that demand special consideration. In support of these applicants the Educational Assistance Program offers appraisal of the academic ability of prospective students through specially developed diagnostic and placement tests; individual academic advisement; development of uniquely designed courses in mathematics, English composition, speech, chemistry, and study skills; personal counseling; and assistance in making application for aid to the Office of Financial Aid. Applicants for participation in the program must submit to the Educational Assistance Program a complete application, a high school transcript showing class graduation rank and courses in progress, and ACT or SAT scores. The address of the Educational Assistance Program is Room 1206 Science and Engineering Offices, University of Illinois at Chicago Circle, Box 4348, Chicago, Illinois 60680.

Honors Programs

Programs for academically superior students are offered in several categories at Chicago Circle beginning in the freshman year. Opportunities for applicants with superior records vary from one college to another because of the comprehensiveness of the curricula offered at the University of Illinois. In the main, a student classified as superior has special advisers and enters special courses or sections of courses as a freshman and as a sophomore; as a junior and a senior he is encouraged to participate in special programs for majors in his department. These programs usually include individual work, seminars, and, in some cases, a senior thesis.

The Edmund J. James Scholars are selected from each freshman class entering the University of Illinois and from the currently enrolled freshmen and sophomores. James Scholars, named in honor of one of the University's most distinguished presidents, have available to them resources of the University not normally utilized by the average college student. The program offers unusual opportunities for an able and industrious student and provides an excellent background for graduate and professional study. A James Scholar is expected to work for a degree with distinction and to carry at least one honors course every quarter when such courses are available to him. A James Scholar may be dropped from the program at his own request or for inadequate scholarship.

Although no monetary award is given to James Scholars, most are eligible for one or more of the scholarships that are available through national, state, or University sources; hence, James Scholars who need financial assistance should apply for monetary scholarships.

High school seniors who have demonstrated high academic potential are eligible to apply for admission to the James Scholar Program. The selection of James Scholars is made on the basis of high school grades, performance on aptitude and achievement tests, other test scores, and the recommendation of high school principals and counselors. Transfer students and students in residence are chosen on the basis of their performance in college and the recommendation of their instructors.

Further information about the James Scholar Program and an application for designation as such may be obtained by addressing the Director, University Honors Programs, University of Illinois at Chicago Circle, Box 4348, Chicago, Illinois 60680.

Academic Honors

Recognition for superior academic achievement at Illinois is given by the University and by the college and department in which a student is enrolled.

To be considered for academic honors in any quarter, a candidate must complete 12 academic hours exclusive of required physical education, basic military science, courses in which he has excused or deferred grades (except in an honors course), and courses completed by an examination for which "pass" is recorded.

Special recognition is given at Commencement to those students who have been on the Dean's List of their colleges for at least three of the four quarters since the last Commencement. If a student has been in residence all four quarters, he must have a cumulative grade-point average of 4.000 (B) or more in addition in being on the Dean's List for three of the four quarters.

The names of new freshmen or of transfer students who enter in the fall quarter will be included if they have been on the Dean's List for the fall and winter quarter preceding Commencement.

Transcripts prepared for these students will carry the notation, "Honors Recognition, 19——."

Edmund J. James Scholars who have maintained since the last Commencement the academic record required by the James Scholar Program will also be recognized. The transcripts of these students will carry the notation, "Edmund J. James Scholar, 19——,"

The Dean's List for the colleges and schools is composed each quarter of those full-time students who have an average of B (4.000) or better in all courses, exclusive of basic military science. Each college may establish requirements above this minimum. This list is posted in the college offices and is sent to the Office of Public Information for distribution to the press.

For Graduation with Honors, See *Graduation Requirements.*

Honor Societies

Alpha Lambda Delta

Membership in this national honor society is open to all freshman women who meet the qualifications established by the National Council of Alpha Lambda Delta. To be eligible a candidate must be a full-time student and have an average of 4.500 or better for all work completed at the end of the first quarter, or 4.500 cumulatively at the end of the second or third quarters of her freshman year. For additional information about this honor society contact the Office of Student Affairs or the University Honors Programs.

Phi Eta Sigma

Membership in this national honor fraternity is open to all freshman men who meet the qualifications established by the National Grand Chapter of Phi Eta Sigma. To be eligible a candidate must be a full-time student who has attained a 4.500 grade-point average in his first academic quarter or a 4.500 cumulative average within the first two or three quarters of his freshman year.

Phi Kappa Phi

Founded in 1897 (University of Illinois chapter in 1933), Phi Kappa Phi is an honor society for juniors, seniors, and graduate students. Faculty members are also elected to a limit of ten each year. Elections to Phi Kappa Phi are made in accordance with its own rules. The University assumes no responsibility for elections.

The society proffers membership to students of high caliber who meet its requirements:

For juniors, a cumulative grade-point average of 4.750.

For seniors, a cumulative grade-point average of 4.500.

For graduate students, successful completion of the preliminary examination, no more than two B grades, and no grades below B.

Detailed information is available in the Office of University Honors Programs.

"Contemporary University" Courses

The offering of the all-campus course, "Contemporary Topics," affords an opportunity for continuing joint examination by students, faculty, and administrators of the problems and concerns of the modern university. The course is open to those with junior standing or with the consent of the instructor. The number of sections varies from quarter to quarter.

Proficiency Examinations for Enrolled Students

Each quarter the University gives proficiency examinations, similar to regular quarter examinations, in courses ordinarily open to freshmen and sophomores. Proficiency examinations for English Composition 101 and English Composition 102 are scheduled regularly. In other subjects the student must obtain the consent of the head or chairman of the department concerned. Proficiency examinations in more advanced undergraduate subjects may also be given if the head or chairman of the department recommends and the dean of the college concerned approves. There is no fee for these examinations.

The grade given in proficiency examinations is either "pass" or "fail" but a student does not receive a "pass" unless he has made at least the equivalent of a C. Neither grade is included in the computation of the student's average, and no official record is made of a "fail."

A student who passes a proficiency examination is given the amount of credit toward graduation regularly allowed in the course if the course is acceptable in his curriculum. However, if such credit duplicates credit counted for his admission to the University, it is not given. Proficiency examinations are given only to:

1. Persons who are in residence at Chicago Circle.
2. Persons who, after having been in residence, are currently registered in a correspondence course at the University of Illinois.

3. Persons who, though not currently enrolled, are degree candidates at the University and need no more than 15 quarter hours to complete their degree requirements.
4. Persons enrolled at one University of Illinois campus who wish to take an examination being given at another campus. They must secure an Application for Concurrent Registration from the Office of Admissions and Records.

Proficiency examinations may *not* be taken:

1. By students who have received credit for more than one quarter of work in the subject in advance of the course in which the examination is requested.
2. To raise grades or to remove failures in courses.
3. In a course the student has attended as a listener or as a visitor.

A proficiency examination is not considered an interruption of residence for graduation, nor is credit earned in this examination counted toward satisfying the minimum requirement toward the degree if the last 45 quarter hours must be earned in residence.

UICC–Malcolm X Dual Enrollment

The Dual Enrollment Program, which allows students from Malcolm X College to take courses at UICC, is a special formalized experimental arrangement within the framework of the Concurrent Enrollment Agreement between the City Colleges of Chicago and UICC. In this program Malcolm X College is responsible for the identification and recruitment, through appropriate criteria, of students who actually or potentially are oriented toward the attainment of a baccalaureate. It is expected that the program will reinforce this orientation by providing study experience in a senior institution while the student is enrolled in an Associate in Arts degree program at Malcolm X College. As participants in this joint program, students will be eligible for monetary awards from the Illinois State Scholarship Commission. They will normally enroll in one course each quarter during their first year and two courses each quarter thereafter if they have fulfilled the prerequisites for such courses. They will be responsible for observing the regulations of each institution while on its campus.

The Native American Program

Organized under the auspices of the Chicago Indian Community and the University, the primary objective of this program is the recruitment of American Indian students, especially those whose educational background has been fragmentary or of low quality, and of providing services that will enhance the academic success of these students. An all-Indian staff and an

Advisory Board with an Indian majority coordinate counseling, tutoring, academic advisement, and financial aid as well as social and cultural activities. Long-range objectives include the appointment of an Indian faculty, development of a curriculum in Indian studies, and a community-service program. Applications or further information may be obtained from the office of the Native American Program, Room 3448, Education and Communications Building.

Audio Information Service

Audio materials in a laboratory setting are provided primarily for foreign-language students; however, the service is also extended to other areas of study to supplement or enhance regular classroom work or to develop special programs. Students come to the Laboratory at their convenience to practice their language skills by means of taped lessons geared to their course work. A dial-access information retrieval system in the Laboratory enables them to select a lesson by operating a telephone dial. They may also use an individual tape deck that gives them complete control over the lesson. In addition to the Laboratory, special services include the Home Telephone Access System, which allows students to obtain taped programs from any on- or off-campus telephone 24 hours a day; the Testing Service, by which instructors can test students' audio (aural) comprehension or oral performance ability; and various special programs. A catalog of audio tape recordings is available on request. The Audio Information Service facilities, located on the third floor of Grant Hall, are open from 8:30 a.m. to 4:30 p.m., Monday through Friday.

Foreign Study Programs (Study Abroad)

Study Abroad programs are available through several language departments. The Department of French is co-sponsor with the Urbana campus of a program in Rouen, France; the department of Spanish is co-sponsor of a program in Barcelona, Spain; the Department of German participates in a program in Baden, Austria; and the Department of Classics participates in a program at the Hebrew University in Israel. Inquiries should be addressed to the appropriate department.

In addition, the College of Liberal Arts and Sciences has established a special course, LAS 299, Liberal Arts Study Abroad, that provides credit for independent foreign study. Inquiries should be addressed to the Campus Coordinator of Year Abroad Programs, College of Liberal Arts and Sciences, 350 University Hall. Information about additional foreign study opportunities can be obtained from the Director of the University Honors Programs, 218 Science and Engineering Offices.

The Division of University Extension

Extramural classes in upper division and graduate courses; both credit and noncredit courses are available. Call 996-8560 or 996-2623 for further information.

Correspondence courses for undergraduate credit only. Write the Division of University Extension, University of Illinois, Urbana, Illinois 61801 for further information.

Professional development courses in social work offered in cooperation with the Jane Addams Graduate School of Social Work. Call 996-7096 for further information.
Short courses and conferences offered in a variety of subject-matter areas. Call 996-7729 for further information.

Correspondence and Extramural Study. Credit for correspondence courses taken through the University of Illinois and other fully accredited institutions may be allowed, but only on approval of the dean of the college concerned. After matriculation a student may, with the approval of the dean of his college, count toward his degree as many as 90 quarter hours of credit earned in extramural courses and/or correspondence study, under the following conditions:

1. If he completes all the remaining requirements for the degree in residence at the University, or
2. If he presents acceptable residence credit for work done elsewhere and completes the requirements needed for his degree in residence at the University. In all such cases he must be in residence for the senior year (three quarters of not less than 45 quarter hours).
3. University of Illinois correspondence and extramural courses are not counted toward satisfying the minimum residence requirements for the degree nor are they considered as interrupting University residence.
4. A resident student enrolled for courses must obtain approval of the dean of his college to enroll concurrently in correspondence courses.
5. A student is not permitted to register in more than three correspondence courses at one time.
6. A student who has been dropped from the University of Illinois for poor scholarship must obtain the recommendation of the dean of his college before completing his application for admission to correspondence work and before completing registration for an extramural course.
7. A student dropped from another collegiate institution is considered for admission to correspondence study only on recommendation of the proper authorities of the institution from which he was dropped.

A student who has completed three years in residence at the University and has earned a minimum of 135 quarter hours may do all or part of his

senior year in extramural or correspondence study or in attendance at another accredited college or university if he meets all of the college requirements for a degree.

Correspondence Study for High School Students

High school students who wish to pursue correspondence study should write directly to the Division of University Extension, Correspondence Course Office, University of Illinois, 104 Illini Hall, Champaign, Illinois 61820, for their application instructions. Inquiry should be made at least two weeks prior to the beginning of any session in which they wish to enroll. For the summer months, applications should be submitted no later than the middle of May.

The Talented Student Program for Illinois High School Seniors

Upon completion of the junior year in high school superior students who can meet University requirements may attend University classes for college credit in one or more of the four quarters at Chicago Circle or they may enroll for college credit in extramural courses or in correspondence courses offered by the Division of University Extension. See *Correspondence and Extramural Study.* Each case is considered individually, and the Director of Admissions and Records, the dean of the college concerned, and the department offering the course must concur in the high school's recommendation as the condition for acceptance. See 1, 2, and 3 below.

Ordinarily, such work taken at the University of Illinois should not be used to accelerate the high school work of a secondary-school student but should be used as a means of broadening and enriching the student's educational program. These students are expected to complete all high school courses required for graduation. The courses taken at the University by superior high school seniors are over and above the regular secondary-school curriculum.

Grades and course credits are recorded on the student's permanent University of Illinois record and appear on any official transcript issued to or for him. If the student enters the University after graduation from high school, the courses are credited toward University graduation if they are applicable to the chosen degree program. For applications and information for prospective students for this program of study, inquiry should be made to the Director of Admissions and Records, University of Illinois at Chicago Circle, Box 4348, Chicago, Illinois 60680.

Students applying for admission to extramural or resident courses under the provisions of this program should arrange for the following materials to reach the Office of Admissions and Records within the deadline periods established for other admissions:

1. A recommendation from the high school principal, specifically endorsing the student for admission to a particular course or courses during the time he is also carrying a full high school schedule.
2. A completed application for admission, including the $20 nonrefundable application fee.
3. An official copy of the high school transcript covering all work thus far completed in high school, including a record of courses in progress (if applicable) and the most recent rank in class. This transcript should be accompanied by any available test scores on such examinations as those conducted by the College Entrance Examination Board and the American College Testing Program (ACT). However, these tests are not required.
4. The applicant's own statement of his belief that he is qualified to undertake college-level work, and an indication of the specific course in which he wishes to enroll.

Military Officers Education Program

The principal objective of the college-level Reserve Officers' Training Corps program is to develop commissioned officers for the Army Reserve and the Regular Army. It is specifically designed to enable potential leaders to prepare themselves for effective service in the Army and also offers individuals training in developing the essential qualities of leadership required for success in either a civilian or a military career.

Participation in the college-level R.O.T.C. program is offered on a voluntary basis to qualified male students. Requirements for enrollment are:

1. United States citizenship (or resident alien).
2. Classification as a full-time student.
3. Ability to qualify for appointment as a second lieutenant before the candidate is 28 years of age.
4. Physical qualifications for a commission.

A student entering the University after successfully completing military training in high school or in a preparatory school that has an accredited Junior Division R.O.T.C. program will be entitled, upon enrollment, to such placement as may be determined by the Professor of Military Science. However, in no case will this placement exceed the first year of the Basic Course.

Instruction is offered through a four-year and a two-year program. The four-year program consists of the Basic Course (the first two years) and the Advanced Course (the last two years). The two-year program consists of the Advanced Course and prior attendance at Basic Summer Camp. Both programs include attendance at Advanced Summer Camp between the junior and senior years, Cadets are issued, at no cost, uniforms, textbooks, and equipment necessary for the R.O.T.C. program.

The Basic Course. Freshmen normally devote two hours a week to military instruction, which consists of one hour of theory and one hour of leadership laboratory. In addition, the cadet must enroll in a nonmilitary course in one of the following categories: effective communications, science

comprehension, general psychology, or political development and political institutions. This course may be one required for graduation by the cadet's college. Sophomores normally devote three hours a week to military instruction—two hours of class and one hour of leadership laboratory.

The Advanced Course. All cadets who have successfully completed the Basic Course, meet the physical and academic requirements, and pass an officer-qualification test and a physical examination are eligible for selection by the Professor of Military Science for the Advanced Course. A cadet selected to enroll in the Advanced Course without prior enrollment in the Basic Course must successfully complete the Basic Summer Camp before such enrollment and have the approval of the Professor of Military Science.

A subsistence allowance of not less than $100 per month is paid to each cadet in the Advanced Course except during attendance at summer camp, when he is paid one-half of the pay rate of a second lieutenant on active duty with less than two years of duty. Travel to and from camp is at government expense. Meals, housing, medical care, uniforms, and all equipment are also furnished while the cadet is at summer camp.

Commissioning. Upon successful completion of the Advanced Course and completion of the degree requirements, cadets will be commissioned as second lieutenants in the United States Army Reserve, and may be offered a commission in the Regular Army. A student may select from the following list the branch of the Army in which he desires to serve:

Adjutant General's Corps	Infantry
Air Defense Artillery	Medical Service Corps
Armor	Military Intelligence
Chemical Corps	Military Police Corps
Corps of Engineers	Ordnance Corps
Field Artillery	Quartermaster Corps
Finance Corps	Signal Corps

Transportation Corps

Deferment from selective service is granted until completion of the R.O.T.C. program to those cadets who are qualified and maintain the required standards. Students will retain their deferment throughout the course in military science, and it may be extended for post-graduate work.

Further information on the program is obtainable by calling 996-3452 or by visiting the Military Officer Education Program, Room 716 Science and Engineering Offices.

Credit Toward Graduation. All colleges and departments recognize military science courses as acceptable electives. The quarter hours accepted toward a degree by the various colleges are:

Art and Architecture	All advanced courses	16 hours
Business Administration	All advanced 2-hour courses	12
Education	All advanced courses	12

Engineering	Completion of four-year program	5
Liberal Arts and Sciences	All advanced courses	16
Physical Education	All military science courses	25

The Athletic Program

Designed to meet the needs of the entire student population, the athletic program consists of the intercollegiate program for men which encompasses thirteen varsity sports — football, basketball, cross-country, track and field, soccer, gymnastics, ice hockey, fencing, wrestling, swimming, baseball, golf and tennis and the Women's Athletic Association programs, which offer several sports for women. An extensive intramural sports program for both men and women is available in over twenty activities. In addition, the Aquiana Swim Club features a competitive synchronized swim team, and the Chicago Circle Dancers offer dance programs. Handball, water polo, and bowling club teams also represent the University in extramural competition. The men's teams participate in the NCAA College Division championships.

Admission to the University

As a state-supported, comprehensive university, the University of Illinois seeks to provide a higher education for those who will profit from an intellectually challenging program. The admission requirements are designed to identify those who possess the scholastic ability and the maturity needed to succeed in and to benefit from such a program.

A qualified applicant seeking admission as a full-time degree candidate may enter any college or school of the University of Illinois at Chicago Circle (with the exception of the College of Architecture and Art) at the beginning of the fall, winter, or spring quarters. Beginning-freshman applicants for the College of Architecture and Art are admitted only at the beginning of the fall and spring quarters. Students whose first registration is in the summer quarter are not automatically eligible to continue in the fall quarter; they must apply separately for that quarter and meet full admission requirements. See *Admission to the Summer Quarter Only.*

Dual Enrollment. Under certain circumstances, students at Chicago Circle may enroll for a limited number of hours in courses offered at the City Colleges of Chicago and, conversely, City College students may enroll at Chicago Circle. Students registered at Chicago Circle should inquire about this reciprocal arrangement at the Office of Admissions and Records; students registered at the City Colleges should inquire at the Registrar's Office of their college.

A student enrolled for the fall semester at a semester-system institution may apply for admission to the winter quarter at Chicago Circle if he is carrying no more than 6 semester hours; unless he wishes to return to his City College campus for his spring semester, he need not apply for dual enrollment.

Concurrent Registration at campuses of the University of Illinois is also permissible. A student enrolled at Chicago Circle or at the Medical Center may obtain an Application for Concurrent Registration at the Office of Admissions and Records of his primary campus.

Admission Requirements

A Beginning-Freshman Applicant must meet two sets of requirements: the general University admission requirements and the requirements of the college or school he wishes to enter. See *Requirements for Admission to Undergraduate Study.* General University requirements state that the applicant must:

1. Be at least 16 years of age. A 15-year-old applicant who meets all other admission requirements may petition for admission.
2. Be a graduate of an accredited high school.
3. Rank in the upper half of his class at graduation or qualify through a sufficiently high score on the American College Test (ACT) or the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board. A nonresident of Illinois must rank in the top quarter of his high school class. See *Residence Classification.*
4. Present 15 units of credit, including those specified in *Requirements for Admission to Undergraduate Study.*

A unit represents one academic year of high school work that consists of 120 sixty-minute periods in the classroom. Two hours of work requiring little or no preparation outside the classroom are considered as having the same value as one hour of prepared classroom work. Fractional credits of less than ½ unit are not accepted. Less than 1 unit of work is not accepted in a foreign language, elementary algebra, plane geometry, physics, chemistry, or biology. The units that meet general University requirements and college or school requirements may be selected from the following groups:

A. *English.* A minimum of 3 units, including English 5 and 6 (junior year). Only courses in the history and appreciation of literature, composition (including oral composition when given as a part of a basic English course), and grammar count toward the 3 units required for admission to all curricula.

B. *Foreign Language.* The requirement for admission to a curriculum that requires a foreign language is fulfilled by 2 units in any one foreign language taken in an accredited high school. Alternatively, the language requirement for admission may be fulfilled by passing entrance examinations for 2 units in any one foreign language regularly taught in the University. Less than 1 unit is not accepted.

C. *Mathematics.* A minimum of 1 unit each in algebra and plane geometry is required for admission to all curricula; however, some curricula require additional mathematics. General mathematics or other courses in mathematics may be accepted in lieu of algebra and plane geometry where the content of the course is essentially the same as that ordinarily included in algebra and plane geometry as determined by the Department of Mathematics at the University of Illinois. If such courses are not equivalent to the prescribed algebra and plane geometry courses or to more advanced courses, they will be accepted as miscellaneous credit.

D. *Science.* Astronomy, biology (or botany and zoology), chemistry, geology, and physics are acceptable. General science will not be accepted as a unit of required science but will be counted as an elective in satisfying the required total of 15 units of acceptable credit.

E. *Social Studies.* Government, commercial or economic geography, economics, history, philosophy, psychology, and sociology are acceptable.

Credit for work completed prior to the ninth grade is accepted by the University if it appears on the transcript of an accredited high school and is certified by the principal to be for a course equivalent in quality and quantity to the course ordinarily offered in that high school. Such credit usually applies to elementary algebra and foreign language; however, it might apply to any subject.

A Transfer-Student Applicant is one who, prior to applying for admission to Chicago Circle, has completed at an accredited college or university, with passing or failing grades, 18 or more quarter hours (12 or more semester hours) of university-level work and must have achieved a minimum transfer grade-point average of 3.000 (C) on the basis of all work attempted. See *The Grading and Grade-Point System of the University.*

Transfer grades for all work attempted are used in computing the transfer student's average. However, a particular college or school may not accept all courses and may delete credits and grades for such courses.

A student transferring to the University who was dropped from a previous collegiate institution for disciplinary reasons must submit a petition to the Director of Admissions and Records, who will forward the petition to the appropriate agency.

A Readmission Applicant, a former student at the University of Illinois who has previously attended any of the three campuses of the University as a regular student, will be considered for readmission on the basis of his status at the time he left the University, any college work he has completed elsewhere since his last attendance at the University, and the capacity at Chicago Circle. See *Transfer to and from Urbana-Champaign.*

A student who did not complete at Chicago Circle the quarter immediately preceding the one in which he wishes to enroll is considered a "former student." If he wishes to enroll in the fall quarter, the previous spring quarter is the "immediately preceding" quarter unless that quarter was used as the student's Off-Quarter Vacation. In that case, if he was enrolled in the summer quarter, it would be the "immediately preceding quarter."

A former student who left the University on academic-drop status, regardless of whether he has attended another collegiate institution in the interval, or who withdrew during the final ten days of instruction of a quarter, must petition the dean of the college concerned when he applies for readmission.

A former student who left the University on clear status or on probation but has attended another collegiate institution from which he was dropped or where he has earned a scholastic average below 3.000 may be readmitted to the University only upon approval of his petition by the dean of the college concerned.

Scholastic probation at the University of Illinois may not be cleared by attendance at another institution except by special action of the dean of the student's college.

A former student who was dropped for disciplinary reasons must submit a petition to the Director of Admissions and Records, who will forward the petition to the appropriate agency.

A Foreign Student (one who resides outside the United States of America) may apply for admission by presenting credentials substantiating his superior scholastic achievement and his official certification either by the educational institution issuing the document or by a local or United States government official. An applicant whose native language is not English must take an English proficiency test even though he may have attended an institution or institutions where some or all of the instruction was presented in English. See *Foreign-Student Admission Procedures* for information about filing an application.

An Irregular-Student Applicant is a person holding a bachelor's degree who wishes to continue study by registering in an undergraduate college. To be admitted to this classification, a student must obtain the approval of the dean of the college he wishes to enter and must fulfill the undergraduate admission requirements. The appropriate application and petition forms may be obtained in the Office of Admissions and Records.

Admission as an irregular undergraduate student in no way implies any commitment by the University to admit the student to a graduate program. The Graduate College will ordinarily not accept credit earned by an irregular undergraduate student if the student is later admitted to graduate study.

Requirements for Admission to Undergraduate Study

Colleges and Curricula	Minimum Scholastic Requirements[1]		Subject Requirements Applicants who do not meet the requirements of a college and/or curriculum may be considered on the basis of evidence that clearly establishes ability to do satisfactory work.	Minimum Number of Units
	High School Rank	Transfer Average		
ARCHITECTURE AND ART Architecture[2] (All Programs)	Residents: Upper ½ or sufficiently high test scores. Nonresidents: Top ¼	3.000	English Algebra Plane Geometry Trigonometry One Foreign Language One or more units in each of the following for a total of Science (except General Science) Social Studies	3 2 1 ½ 2 4
Art (All Programs) History of Architecture and Art			English Algebra Plane Geometry One Foreign Language One or more units in at least two of the following for a total of Foreign Lanugage (in addition to the two units required) Mathematics (beyond Algebra and Plane Geometry) Science (except General Science) Social Studies	3 1 1 2 5
BUSINESS ADMINISTRATION[2] (All Programs)	Residents: Upper ½ or sufficiently high test scores. Nonresidents: Top ¼	3.000	English Algebra Plane Geometry One Foreign Language Science (except General Science) Social Studies	3 2 1 2 2 2

EDUCATION Curriculum in Teacher Education (Elementary)	Residents: Upper ½ or sufficiently high test scores. Nonresidents: Top ¼	Under 90 hours: 3.300 90 hours or more 3.500	English Algebra Plane Geometry One or more units in at least three of the following for a total of Foreign Language (at least two units in the same language) Mathematics (beyond Algebra and Plane Geometry) Science (except General Science) Social Studies	3 1 1 7
ENGINEERING[2] (All Programs)	Residents: Upper ½ or sufficiently high test scores. Nonresidents: Top ¼	3.000 3.000	English Science (except General Science) Mathematics (including work in Algebra, Geometry and Trigonometry* Additional units from the following for a total of Social Science Additional English Additional Science (except General Science) Additional Mathematics Foreign Language *Students with less than three units of mathematics may be admitted to the College upon petition, in which case they must demonstrate their ability to do satisfactory work. Course work must be taken to make up the mathematics entrance requirements, but it cannot be used for credit toward the baccalaureate in the College of Engineering.	3 1 3 5
LIBERAL ARTS AND SCIENCES Curriculum: Criminal Justice, General,* Medical Dietetics, Medical Laboratory Sciences, Medical Record Administration, Preprofessional Curriculum in Nursing, Prepharmacy. *For majors in this curriculum see page 137.	Residents: Upper ½ or sufficiently high test scores. Nonresidents: Top ¼	3.000	English Algebra Plane Geometry One Foreign Language One or more units in at least two of the following for a total of Foreign Language (in addition to the two units required) Mathematics (beyond Algebra and Plane Geometry) Science (except General Science) Social Studies	3 1 1 2 5

[1]If capacity is limited, admission priority will be granted in the order of scholastic excellence.

[2]Applicants who meet the quantitative mathematics requirements but do not present specific units in advanced algebra and trigonometry may be considered to have met these requirements if they present other courses in mathematics that have algebra and plane geometry as prerequisites.

Colleges and Curricula	Minimum Scholastic Requirements[1]		Subject Requirements	Minimum Number of Units
	High School Rank	Transfer Average		
Teacher Education (Secondary) Curricula: Biological Sciences, Chemistry, Earth Sciences, English, French, Geography, German, History, Mathematics, Physics. Russian, Sociology, Spanish Speech.	Residents: Upper ½ or sufficiently high test scores. Nonresidents: Top ¼	Under 90 hours: 3.300 90 hours or more: 3.500	English Algebra Plane Geometry One Foreign Language One or more units in at least two of the following for a total of Foreign Language (in addition to the two required) Mathematics (beyond Algebra and Plane Geometry) Science (except General Science) Social Studies	3 1 1 2 5
Preprofessional Curricula: Dentistry		3.250		
Occupational Therapy,[2, 3] Veterinary Medicine		3.500		
Curriculum in Chemistry[4]		Under 90 hours: 3.000 90 hours or more: 3.500	English Algebra Plane Geometry Trigonometry One Foreign Language One or more units in each of the following for a total of Science (except General Science) Social Studies	3 2 1 ½ 2 4
Curriculum in Physics[4]		3.000		

PHYSICAL EDUCATION Option I—K 12 Certification Option II—Secondary School Certification Option III—Noncertification	Residents: Upper ½ or sufficiently high test scores. Nonresidents: Top ¼	Under 90 hours: 3.300 90 hours or more: 3.500	English Algebra Plane Geometry One or more units in at least 3 of the following for a total of One Foreign Language (at least two units in the same language) Mathematics (beyond Algebra and Plane Geometry) Science (except General Science) Social Studies	3 1 1 7

[1]If capacity is limited, admission priority will be granted in the order of scholastic excellence.

[2]Limited program only

[3]Special Requirement: Recommendations from the University Health Service and the Director of Occupational Therapy Curriculum (Medical Center).

[4]Applicants who meet the quantitative mathematics requirements but do not present specific units in advanced algebra and trigonometry may be considered to have met these requirements if they present other courses in mathematics which have algebra and plane geometry as prerequisites.

Substitutions for and Exemptions from the Admission Requirements

Entrance Examinations. Students who do not meet the high school subject requirements, or who are not high school graduates, or who have been graduated from an unaccredited secondary school may remove these deficiencies by passing examinations specified by the University of Illinois.

General Educational Development Tests. The high school level General Educational Development Tests (GED Tests) cover the following subjects: English, mathematics, social studies, and natural science. Successful completion of the tests satisfies the following admission requirements:

1. English and social studies subject requirements.
2. High school graduation.
3. Validation of credits earned in and graduation from an unaccredited high school.

Completion of the tests does *not* satisfy the algebra-geometry requirement or the science requirement. Credit in those subjects must be presented from accredited sources.

The General Educational Development Tests may be taken by persons in these categories:

1. Persons 19 years or older who have not been graduated from high school.
2. Persons, regardless of age, who have not been graduated from high school, who have been out of high school for one year, and who have written approval of the Director of Admissions and Records.

The University of Illinois does not accept credit granted through the General Educational Development college-level examinations.

American College Test (ACT). Applicants who meet the age requirement for admission to the University may use the American College Test in lieu of the General Educational Development Tests to:

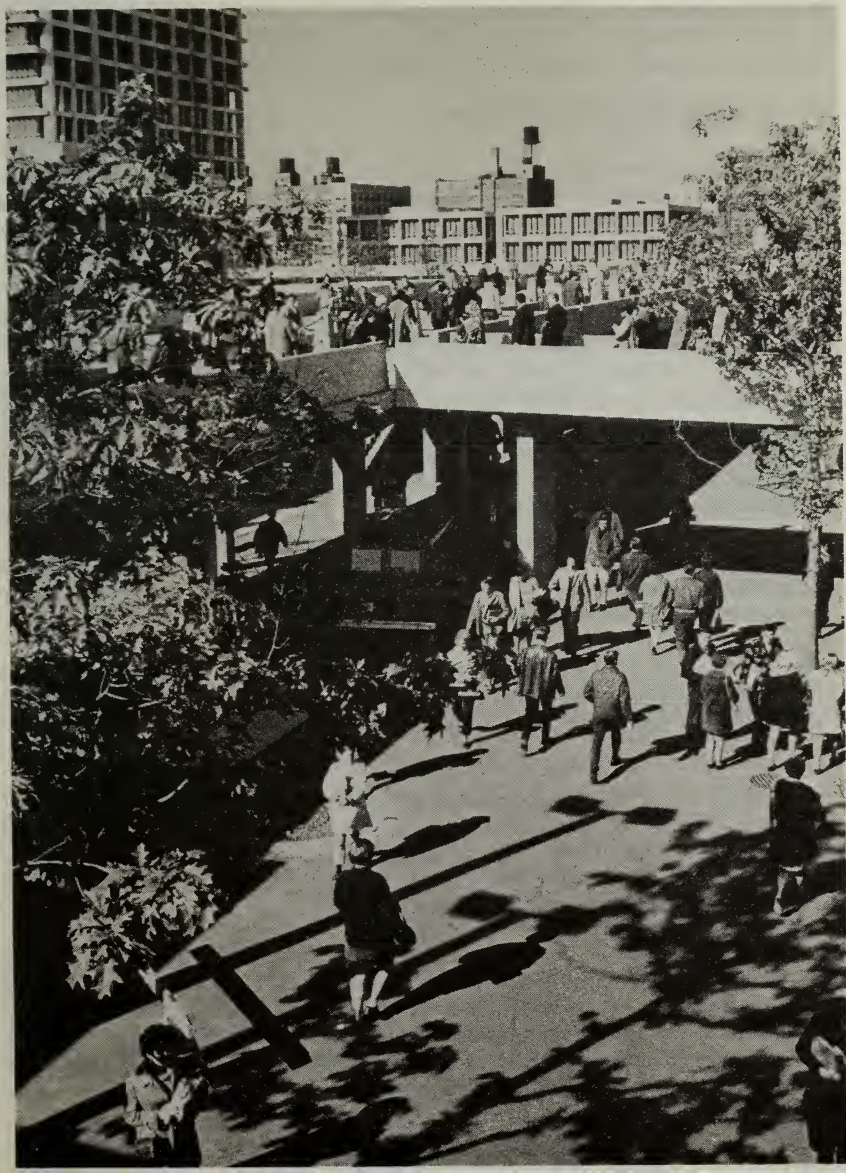
1. Validate credit earned in an unrecognized high school.
2. Meet the requirement of high school graduation.
3. Satisfy specific subject deficiencies.

The English credit allowed for the ACT satisfies the English requirement for admission. The mathematics credit allowed for the ACT does *not* satisfy the algebra-geometry requirement for admission.

Subject Examinations in certain areas may be requested by a student who, lacking one or more of the high school requirements, feels he has

sufficient knowledge to pass the prescribed examination. He should initiate his request in the Office of Admissions and Records.

Admission by Special Action. A student who is deficient in one or more of the admission requirements may be admitted, with the approval of the Director of Admissions and Records and the dean of the college he wishes to enter, provided he submits evidence that clearly establishes his ability to do satisfactory work in the curriculum in which he wishes to enroll.



Admission with Advanced Standing

Advanced standing consists of college-level credit acceptable to the University. The application of such credit toward a degree, however, is at the discretion of the dean of the college offering the degree.

In all cases, the transferred credit accepted by the University is subject to review by the student's college and major department for evaluation of its applicability to a particular degree, and the student is expected to conform to all the requirements of his chosen curriculum. See *The 90-Hour Rule.*

Credit From Other Institutions

Fully Accredited Institutions. Work successfully completed in other fully accredited institutions (either those approved by one of the regional accrediting associations or those approved by one of the agencies recognized by the National Commission on Accrediting) is generally accepted by the University on an hour-for-hour basis, as shown on the official transcripts received from those institutions. For consistency, credit in semester hours is converted to credit in quarter hours. See *Quarter Hours.*

Provisionally Accredited Institutions. Work completed in a provisionally accredited institution is accepted only on a *deferred* basis. To receive such transfer credit, a student must earn at least a 3.000 (C) average (or higher if prescribed by the curriculum the applicant wishes to enter) within the first 18 to 45 quarter hours of work in residence at the University of Illinois or in another fully accredited collegiate institution. If the student fails to validate his transferred credit within the validation period, he then must pass proficiency examinations if he is to receive credit for his work at the provisionally accredited institution.

Unaccredited Institutions. Credit from unaccredited institutions is not accepted. However, credit in courses taken in such institutions may be established by proficiency examinations. See *Proficiency Examinations for Enrolled Students.*

Junior College Credit. Admission of transfer students to the University of Illinois is based *only* on transfer work, the nature of which has prepared students to continue in baccalaureate-degree programs. Junior college students should check with their junior college counselors to determine those two-year college courses that have been designated baccalaureate-oriented.

Ninety-Hour Rule. Credit transferred from an accredited junior college is limited only by the provision that the student must earn at least 90 quarter hours required for the degree after he attains junior standing at the University of Illinois or at any other approved four-year institution, *except* he must meet the residence requirements for a degree from the University. See *Requirements for Graduation.* When a school or college requires three years

of preprofessional college credit for admission, at least the last 45 quarter hours of preprofessional credit must be earned in an approved four-year collegiate institution.

Credit transferred from an accredited junior college is limited only by the provision that the student must earn at least 90 quarter hours required for the degree after he attains junior standing at the University of Illinois or at any other approved four-year institution, *except* he must meet the residence requirements for a degree from the University. (See *Requirements for Graduation.*) When a school or college requires three years of preprofessional college credit for admission, at least the last 45 quarter hours of preprofessional credit must be earned in an approved four-year collegiate institution.

Credit for Military Service

Completion of not less than six months of extended active duty in any branch of the armed forces of the United States entitles an applicant to six quarter hours of credit in physical education and six quarter hours in basic military science if the applicant has been honorably separated.

Credit is also allowed for those United States Armed Forces Institute (USAFI) courses for which the American Council on Education recommends credit at the baccalaureate level, provided the student has passed the appropriate USAFI end-of-course test or examination.

Credit for service schools successfully completed and for other courses taken while the student was in service may be allowed after evaluation by the Office of Admissions and Records.

No credit is allowed for the college-level General Educational Development Tests.

Credit Through the Advanced Placement Program

This program, administered by the College Entrance Examination Board, is designed for those high school students about to enter college who wish to demonstrate their readiness for courses more advanced than those ordinarily studied during the freshman year. College credit is awarded to those students who earn sufficiently high grades on the examinations covering basic freshman-course subject matter. Many high schools offer advanced classes in one or more of the following subjects: art, English, French, German, Latin, Spanish, American history, European history, biology, chemistry, mathematics, music, and physics. The University encourages able high school students to enroll in these courses and to write the examinations in one or more of the foregoing subjects. The examinations are prepared by joint national committees of high school and college teachers and are administered by the Educational Testing Service. These examinations, graded by other national committees, have the following values: 5—extremely well qualified, 4—well qualified, 3—qualified, 2—possibly qualified, 1—no recommendation.

The University of Illinois at Chicago Circle makes these specific credit recommendations:

Humanities

English
1. Grades of 5, 4, and 3: 12 quarter hours of credit in English 101, 102, 103.
2. Grade of 2: No credit.

French
1. Grades of 5 and 4: 8 quarter hours of credit.
2. Grade of 3: Referred to the department.
3. Grade of 2: No credit.

German
1. Grades of 5 and 4: 8 quarter hours of credit.
2. Grade of 3: Referred to the department.
3. Grade of 2: No credit.

Latin 4
1. Grades of 5, 4, and 3: 4 quarter hours of credit at the lower-division level.
2. Grade of 2: Referred to the department.

Latin 5
1. Grades of 5, 4, and 3: 8 quarter hours of credit at the lower-division level.
2. Grade of 2: Referred to the department.

Spanish
1. Grades of 5 and 4: 8 quarter hours of credit in Spanish 105 and 106.
2. Grades of 3 and 2: Referred to the department.

Note: French, German, and Latin papers do not carry automatic credit in a particular foreign language course. Hence, the student, in consultation with the appropriate department, may select the course for which he is best qualified. When such selection has been determined, credit, up to a maximum of 8 hours, will be granted in courses preparatory for that in which the student has been placed.

Music
1. Grades of 5, 4, and 3: 8 quarter hours of credit in Music 130 and 131.
2. Grade of 2: No credit.

Social Studies

American History
1. Grades of 5 and 4: 8 quarter hours of credit at the lower-division level.
2. Grade of 3: 4 quarter hours of credit at the lower-division level.
3. Grade of 2: No credit.

European History
1. Grades of 5 and 4: 8 quarter hours of credit at the lower-division level.
2. Grade of 3: 4 quarter hours of credit at the lower-division level.
3. Grade of 2: No credit.

Note: No more than 8 quarter hours of advanced placement credit may be counted toward the major in history. All history majors are required to take 4 hours of 100-level history at the University of Illinois at Chicago Circle.

Natural Sciences and Mathematics

Biology
1. Grades of 5, 4, and 3: Credit for Biological Sciences 100, 101, 102 (12 quarter hours).
2. Grade of 2: No credit.

Chemistry
1. Grades of 5 and 4: Credit for three quarters of general chemistry (15 quarter hours) and permission to enroll in Chemistry 121.
2. Grade of 3: Credit for two quarters of general chemistry (10 quarter hours) and permission to enroll in Chemistry 114. Each student may take a proficiency examination in Chemistry 114 immediately after enrolling. If he passes, he is given credit in that course also and is permitted to register in the next chemistry course in sequence.

Mathematics
1. Grade of 5 on the AB or BC examination: Credit in Mathematics 130, 131, 132, 133 (20 quarter hours) and advanced placement in any course for which Mathematics 133 is a prerequisite.
2. Grade of 4 on the AB or BC examination: Credit in Mathematics 130, 131, 132 (15 quarter hours) and advanced placement in Mathematics 133.
3. Grade of 3 on the AB or BC examination: Credit in Mathematics 130, 131 (10 quarter hours) and advanced placement in Mathematics 132.
4. Grade of 2 on BC examination: Credit in Mathematics 130 (5 quarter hours) and advanced placement in Mathematics 131.
5. Grade of 2 on the AB examination: Students in this category are invited to take a proficiency examination in Mathematics 130. Passing of this examination will give 5 quarter hours of credit in Mathematics 130 and advanced placement in Mathematics 131.

Physics
1. Grades of 5 and 4: Credit in Physics 111 (4 quarter hours) or Physics 101 (5 quarter hours), depending on the student's curriculum.
2. Grade of 3: Automatic admission to a proficiency examination that covers Physics 111, 112, 113, and 114 or Physics 101, 102, and 103, depending on the student's curriculum. Grades of A or B on the proficiency examination on the first sequence carry 19 quarter hours

of credit; on the second sequence, 15 quarter hours of credit. Grades of C: Consult the Department of Physics.

3. Grade of 2: With the approval of the Department of Physics, students may write a proficiency examination in any one of the courses in the sequences listed in paragraph 2. Credit will be allowed only for those courses in which the student has proficiency examination grades of C or higher.

Credit Earned Through the American College Test

Students whose American College Test subscore in English is 27 or higher will be given 4 hours of credit in English Composition 101. Those whose American College Test subscore in English is 25 or 26 may register for the honors sequence in English Composition 101 and 102. No comparable provisions exist for the other subscores on the ACT.

Admission Procedures

Application Fee. All applicants for admission pay a nonrefundable application fee of $20, to be enclosed with the application sent in the official envelope provided with the application blank.

An undergraduate applicant falls into one of three major admission categories: beginning freshman, transfer student, or readmission applicant. The specific steps to be completed by the applicants in each category follow. Application blanks may be obtained by mail, telephone, or in person from the Office of Admissions and Records, University of Illinois at Chicago Circle, Box 4348, Chicago, Illinois 60680.

Pre-application Advising. Admissions and Records also maintains a preadmission advising service, which is available to all prospective students. An appointment is not required, and inquiries are welcome during the normal working day, Monday through Friday. Members of this section also visit high schools and junior colleges in the Chicago area to explain fully the admission requirements and procedures. They will also, on request, arrange for high school students and counselors to come to the campus for group discussions and tours.

Beginning-Freshman Applicants. High school seniors who wish to enter a fall quarter are encouraged to submit their applications for admission as early as possible after October 15 of their senior year. See *Application Deadlines.* The completed application and a check or money order for $20 made out to the University of Illinois should be submitted to the high school principal with the request that they be mailed in the appropriate envelope *together with* an official transcript of the high school, which should include:

For the student in the seventh semester (first semester of the senior year): grades for the first three years, rank in class at the end of the sixth

semester, courses in progress during the seventh semester, and courses planned for the eighth semester (or a statement that those in the seventh will continue through the eighth semester), and the probable date of graduation.

For the student in the final semester of his senior year: grades for the first seven semesters, rank in class at the end of the seventh semester, courses in progress, and the probable date of graduation.

A student who has been graduated from high school but has not completed a sufficient number of college credit hours to be classified as a transfer student[1] should submit the complete application and a check or money order for $20, made out to the University of Illinois, to his high school principal with a request that they be mailed directly to the Office of Admissions and Records *together with* a final transcript of his high school record and a statement of his scholastic rank when he was graduated.

Beginning-Freshman applicants who wish to enter a quarter other than the fall quarter must follow the foregoing procedures.

Application Deadlines for Beginning-Freshman Applicants

Fall	October 15 of previous year	May 1
Winter	October 15	December 1
Spring	December 1	March 1
Summer*	March 1	June 1

*See *Admission to the Summer Quarter Only.*

Students in all the foregoing categories must have their official scores on the tests administered by the American College Testing Program (ACT) sent to the Office of Admissions and Records directly from the testing agency. Information about where and when to take the ACT may be obtained from the high school counselor or by writing the ACT Registration, P.O. Box 414, Iowa City, Iowa 52240. If the applicant has completed this test but did not request that the scores be sent to the Office of Admissions and Records at Chicago Circle, he should send $2 (two dollars) to the Records Department, American College Testing Program, P.O. Box 451, Iowa City, Iowa 52240, together with a request that a copy of the scores be mailed to the Office of Admissions and Records. An applicant who has not taken the ACT but has taken the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board should have his official scores submitted to the same

[1]A beginning freshman applicant who has completed fewer than 12 semester hours (18 quarter hours) of college level work must have an official transcript of that work forwarded to the Office of Admissions and Records. If he is currently enrolled at the time he submits his application, the transcript should include the courses in progress.

[2]Admission consideration will end if capacities are reached prior to the deadline.

office; he will be considered for admission on the basis of those scores. If either the ACT or the SAT is taken more than once, the highest score reported is used to determine the scholastic index.

The University of Illinois urges prospective entering freshmen to take one or the other of the tests in the latter part of the junior year in high school or as soon thereafter as possible.

Transfer Applicants (For definition, see page 32.) If a transfer applicant is not presently enrolled in college, he should mail his application in the appropriate envelope addressed to the Office of Admissions and Records. At the same time, he should request his high school principal and the registrar of each collegiate institution he has attended to send official transcripts to the Office of Admissions and Records. See *Rolling Admissions Program.*

If the applicant is enrolled in college at the time he submits an application, he should comply with the directions above and, during the last term in which he is enrolled in his current college, request that the transcript from that institution include a list of the courses he is taking. His cumulative grade-point average may make it necessary to delay final decision on his application until he has completed work at the institution from which he plans to transfer.

Application Deadlines for Transfer and Readmission Applicants

Quarter	*Applications accepted on and after*	*Deadline*[1]
Fall	February 1	May 1
Winter	October 15	December 1
Spring	December 1	March 1
Summer*	March 1	June 1

*See *Admission to the Summer Quarter Only.*

Readmission Applicants (For definition, see page 32.) If an applicant has previously attended one or more campuses of the University of Illinois, he must so indicate on his application, for he will need to submit only those transcripts for work completed since the University of Illinois attendance. See *Transfer to and from Urbana-Champaign.*

Note: A student whose *only* previous registration at the University of Illinois was in correspondence or extramural courses or as a nondegree candidate summer-quarter-only registrant must present complete records of all scholastic work, both high school and collegiate, as outlined above for new students, and must meet the admission requirements of his chosen college and curriculum if he is to be considered for admission.

[1]Admission consideration will end if capacities are reached prior to the deadline.

Foreign-Student Applicants. Applicants from outside the United States of America should request from the Office of Admissions and Records an Application for Admission for Applicants in Other Countries. The application, original or certified copies of education credentials, and a check or money order for $20 (nonrefundable application fee) should be sent to the Office of Admissions and Records in the special envelope provided.

All credentials for foreign-student applicants must include all secondary and post-secondary level studies completed to date, grades or examination results received (both failing and passing), maximum and minimum grades obtainable, rank in class, degrees, diplomas, certificates earned, and length of the school year. Original documents in languages other than English must be accompanied by official English translations.

Applicants whose native language is not English will be required to take an English proficiency test, even though the foreign instruction was in English. The proficiency test prescribed is the Test of English as a Foreign Language (TOEFL), and arrangements usually can be made to take it in the country in which the applicant lives. If that is not possible, arrangements may be made by writing to the Educational Testing Service (ETS), Box 899, Princeton, New Jersey 08540. TOEFL is not required for students from *countries* where English is the native language.

If the foreign applicant is admissible, his performance on the English test will either (1) excuse him from further study of English, or (2) indicate the need for additional study of English. In the latter event, he is required to take a placement test administered by the Coordinator for Foreign Student Affairs prior to his registration. The results of the Placement Test determine whether or not the student is required to register for one or more zero credit courses in English. If so, his program of credit courses is reduced accordingly, and a longer time may be necessary for completion of his degree requirements.

Rolling Admissions Program

Chicago Circle operates on a "rolling admissions" program, under which an applicant who submits his application and required records early in the period set aside for processing applications for admission to a specific fall quarter will receive notification of his eligibility within a correspondingly early period.

High School Seniors who wish to enter the fall quarter are encouraged to submit their applications for admission at the earliest possible date in the senior year. See *Admission Procedures.* By so doing, the prospective Chicago Circle freshman will have an opportunity to participate in advance enrollment during the spring and summer months prior to fall enrollment. The deadline for submission of completed* applications is May 1 or until capacity is reached, whichever occurs first, and action is taken on individual applications in the order in which they are completed.

(Note: Beginning-freshman applicants whose completed applications were on file on and before November 30, 1971 were notified on or about December 18 of that year as to their admissibility for the fall quarter 1972.)

*A completed beginning-freshman applicant is one for which a high school transcript and official test scores are on file in the Office of Admissions and Records.

Because capacities have been rapidly increased, the enrollment of beginning freshmen at Chicago Circle has risen steadily and no reduction is anticipated in the immediate future. However, if it is necessary to limit admission approvals for any given quarter, the Program of Progressive Admission will be activated. Under this program, admission priority is given to those students who demonstrate high scholastic ability. A combination of test score and rank in class forms the selection index for beginning freshmen.

Transfer-Student Applicants and Former-Student Applicants whose applications and all supporting credentials are on file well in advance of the quarter for which admission is sought will benefit by receiving earlier notification of admissibility, under the Rolling Admissions Program. See *Admission Procedures.*

If it becomes necessary to limit admission at either the lower division (under 90 quarter or 60 semester hours) or upper division (90-and-above quarter hours or 60-and-above semester hours), admission priority will be granted in the order of scholastic excellence, in accordance with the Program for Progressive Admission, to as many applicants as capacities allow. For new transfer students and former University of Illinois students seeking readmission, the cumulative average for all previous collegiate work is the index.

Admission to the Summer Quarter Only

Because of the demand from Chicago-area residents for nondegree programs during the summer, admission may be granted for that quarter only. The requirements are:

1. For a Beginning Freshman: graduation from high school.
2. For a Transfer Student (including those on probation): eligibility to return to his former institution.
3. For a Readmission Applicant (including those on probation): good standing on the last campus attended at the University of Illinois.

Students in categories 2 and 3 above who are not in good standing should obtain a list of full requirements from the Office of Admissions and Records.

Summer-quarter-only students are *not* admitted to the several academic colleges at Chicago Circle and do not submit regular admission applications; they must procure from the Office of Admissions and Records the special application form "Summer Quarter Only." Requests for this form may be made on and after March 1.

Applications for admission to summer quarters must be accompanied by the nonrefundable application fee of $15.

Continuation for an ensuing fall quarter as a degree candidate at Chicago Circle requires submission of the regular application blank and all necessary supporting documents, and fulfillment of the admission requirements for the desired curriculum. Only one application fee is required if applications are submitted for both the summer and fall quarters.

Selection of College and Curriculum

A beginning-freshman applicant who is in doubt about the courses of study he should pursue may secure help in reaching a decision by attending the guidance program of the University. The Student Counseling Service offers Freshman Guidance Examinations to second-semester high school seniors and to high school graduates. Applicants are strongly urged to take these examinations; information will be sent to all beginning-freshman applicants by the Office of Admissions and Records. If he completes the examinations and submits his ACT scores, the applicant will receive an appointment from the Student Counseling Service, which offers professional counseling. However, completion of the Freshman Guidance Examination has no bearing on an applicant's eligibility for admission.

Applicants should not delay submission of the application until after the consultation with the Student Counseling Service; if, as a result of counseling, the applicant wishes to change the college and curriculum he had previously designated, he may make a written request to the Office of Admissions and Records.

Additional Records

If, in individual cases, records in addition to those listed for prospective beginning-freshman, transfer, and readmission applicants are needed, the applicant will be notified by the Office of Admissions and Records. Such records may include a recommendation from a college dean, an Illinois residence clarification, name clarification, approval for admission to specific programs, or other documents.

Permit to Enter

After a student has been admitted, he or she is sent either a Permit to Enter or a Notice of Readmission, as appropriate. These documents are statements of confirmation of reserved space in the college and curriculum he desires and a description of any advanced standing allowed him on admission or readmission. Also enclosed are the instructions he must follow to complete his registration.

Registration Procedures

Registration is the act of enrolling in an approved program of courses after a new student has been granted a Permit to Enter or a continuing student advance enrolls. Registration includes:

1. Course placement tests. (Not required of readmitted or continuing students.)

2. A medical examination. (Not required of readmitted or continuing students.)
3. Program advisement and approval.
4. Payment of tuition and fees indicated on fee assessment cards issued by the Office of Admissions and Records.

Until the student has completed *all* of the foregoing procedures (where applicable), he is not fully registered in the quarter to which he has been admitted. A registration is not complete unless the fee card and the fee receipt card have been deposited with a Business Office cashier, regardless of whether the student is subject to payment of tuition and fees.

A Program consists of the courses and sections in which a student is currently registered.

Off-Quarter Vacations. A student may elect to attend any three quarters in one calendar year. If he chooses to use a quarter *other than the summer* as his vacation, or Off Quarter, he must file an application with the Office of Admissions and Records before the first day of instruction of the quarter he wishes to use as vacation. Application blanks for the purpose are available in that office. If the vacation quarter is other than the summer quarter, the student must attend the summer quarter of that calendar year if he wishes to retain his status as a continuing student.

The Medical Examination

All new students are required to take a medical examination prescribed by the University Health Service. This examination must be administered by the student's own physician at the student's expense. Instructions and the required forms are mailed by the University after admission approval.

After the medical examination is completed and the forms are returned to the Health Service, the student will be sent a receipt, which he must bring to his advisement and registration conference.

The Placement Tests

Required of most students registering for the first time in the University of Illinois, these tests determine course placement and are not taken until after an applicant receives his Permit to Enter. Instructions about the tests are clearly stated in the material enclosed with the permit. A new student must ascertain from those instructions whether he must take the placement tests in a foreign language, mathematics, and chemistry, since all tests are not required of all students.

Academic Advisement

All new and former students who have been granted admission or readmission to a fall quarter are scheduled for conferences on campus during

the summer months. At that time, they are advised by representatives of the several colleges, who assist them in selecting courses for the fall quarter.

Regular registration is also held prior to the beginning of instruction of the fall quarter.

Students admitted and readmitted to the winter, spring, and summer quarters meet with college advisers, select courses, and pay tuition and fees at the registration times scheduled for those quarters.

Tuition, Fees and Charges

Tuition and some fees are assessed all students and are payable in full as part of registration. Under certain circumstances arrangements may be made with the Office of Business Affairs to defer payment. The amount of the tuition and the service fee varies with the number of credit hours for which the student registers, and subsequent change in the number of hours carried could result in a change in those amounts. Tuition (but not the service fee) also varies according to the Illinois resident or nonresident status of the student.

Tuition and Fees—Chicago Circle
(Subject to Change)

	12 quarter hours and above		less than 12 and more than 5 quarter hours		Range III 0 through 5 quarter hours		Range IV 0 credit only Resident and Nonresident
	Res.		Res.		Res.		
Tuition (except those holding exemptions)	$165	$495	$113	$333	$ 62	$ 172	$31
Service Fee	32	32	24	24	14	14	7
Hospital-Medical-Surgical Insurance Fee	15	15	15	15	15	15	15
Total	$212	$542	$152	$372	$91	$201	$53

Tuition for Zero-Credit Courses. Students taking one or more courses for zero credit, but no courses for credit, will be assessed for tuition and fees as follows:

a. *For study on-campus:* One-half of the Range III resident tuition and one-half of the Range III service fee, each rounded to the next higher

even dollar, and the full hospital-medical-surgical fee. (No charge will be assessed, however, for University employees who register at the request of their department, only in zero-credit courses especially established to improve the work of the employee.)

b. *For study off-campus,* including graduate registration in absentia: One-half of the Range III resident tuition, rounded to the next higher even dollar, but no service fee and no hospital-medical-surgical fee.

Students simultaneously taking one or more courses for zero credit and one or more courses for credit will be assessed for tuition and fees on the basis of the credit course(s) only.

Residence Classification. The residence classification of an applicant is determined on the basis of information given on his application and other credentials. Fees are assessed in accordance with this decision. If the student believes he has a legitimate cause for change of status, he may petition for a change on a form provided by the Office of Admissions and Records. Petitions are considered *within thirty days* from the date designated in the official University Calendar as that upon which instruction begins for the academic period for which the fee is payable. However, if the nonresident tuition was not assessed on or prior to that date, the claim for refund may be filed *within thirty days* after the nonresident fee was assessed and the student was given notice of its assessment. Additional evidence to substantiate a request may be required. If the student expects to ask for a change of residence classification, it is advisable for him to request that the adjustment be made prior to the registration period.

In the event a student who claims he is a resident is dissatisfied with an adverse ruling by the Director of Admissions and Records, he may obtain a review of such decision by the Legal Counsel of the University by filing a written request with the Director of Admissions and Records within twenty days after he has been notified of the ruling.

Further information concerning residency may be secured from the Office of Admissions and Records. A brochure entitled *Regulations Governing Assessment of Resident or Nonresident Student Fees* is also available.

Exemptions and Assessments

A student may be exempted from one or more of the following charges if he qualifies under the stated conditions:

Tuition is waived for:

1. Holders of tuition-waiver scholarships.
2. All academic employees of the University or allied agencies on appointment for at least 25 percent but not more than 67 percent of full-time service.

3. All permanent nonacademic employees of the University or allied agencies on appointment for at least 25 percent of full time whose registration for University courses falls within Range II or Range III.
4. Holders of graduate tuition-and-fee waivers awarded by the Graduate College.
5. Holders of outside-sponsored grants or contracts that provide payments to cover the total costs of instruction.
6. Teachers and administrators who cooperate in the practice teaching program. (Exemption is allowed for each quarter of assignment within the same calendar year—September through August.)
7. Persons registered in noncredit seminars only.
8. University employees registered at the request of their departments in noncredit courses especially established to improve the work of the employee.
9. Emeriti.

The nonresident portion of tuition (if the enrollee is subject to payment of tuition) is waived for:

1. All staff members (academic, administrative, or permanent nonacademic) on appointment for at least 25 percent of full time with the University or allied agencies.
2. The faculties of state-supported institutions of higher education in Illinois.
3. The teaching staff in private and public elementary and secondary schools in Illinois.
4. The spouses and dependent children of those listed in items 1 and 2. (Dependent children are those who qualify as dependents for federal income tax purposes.)
5. Persons actively serving in one of the Armed Forces of the United States who are stationed and present in the State of Illinois in connection with that service.
6. The spouses and dependent children of those listed in item 5, as long as they remain stationed, present, and living in Illinois.
7. Members of families of foreign diplomats whose assignment requires residence within the state of Illinois.

For fee assessement purposes, a staff appointment must be for not less than three-fourths of the term. This is interpreted as a minimum of nine weeks in a quarter. Staff tuition-and-fee privileges do not apply to students employed on an hourly basis in either an academic or nonacademic capacity or to persons on leave without pay.

For fee assessment purposes, a permanent nonacademic employee is defined as a person who has been assigned to an established, permanent, and continuous nonacademic position and who is employed for at least 25 percent of full time. University employees appointed to established civil service positions whose rate of pay is determined by negotiation, prevailing rates, or union affiliation are entitled to the same tuition-and-fee privileges accorded other staff members under the regulations.

A student who resigns his staff appointment, or whose appointment is cancelled before he has rendered service for at least three-fourths of the term,

becomes subject to the full amount of the appropriate tuition and fees for that term unless he withdraws from his University classes at the same time the appointment becomes void or unless he files clearance for graduation within one week after the appointment becomes void.

Fees

The Service Fee is applied toward the operating expense of Chicago Circle Center, the financing of the Center building, and the cost of the Student Activities Program.

The service fee is waived for:

1. All staff members of the University or allied agencies who are on appointment for at least 25 percent but not more than 67 percent of full time.
2. Holders of graduate tuition-and-fee waviers awarded by the Graduate College.
3. Students registered *in absentia.*
4. Students registered in courses taught off campus.
5. Holders of grants or contracts from outside sponsors if the service fee is charged to the contract or to grant funds.
6. Cooperating teachers and administrators described under *Exemptions,* item 6.
7. Persons registered in noncredit seminars only.
8. University employees, registered at the request of their department in noncredit courses for the purpose of improving their work.
9. Emeriti.

The Hospital-Medical-Surgical Insurance Fee is the same for all students, regardless of the number of hours for which they are enrolled or of their Illinois residence status. All students enrolled and in attendance at Chicago Circle are covered by a health insurance policy, for which they pay a fee each quarter at registration. Eligible dependents of insured students (spouse and/or unmarried dependent children under nineteen years of age) may also be insured if the student makes application to the University Cashier (Room 406, University Hall) within the time specified by the insurance policy.

If a student withdraws from the University, he does not receive an insurance fee refund since he remains insured for the balance of the quarter from which he withdrew. Special provisions exist for students to be covered by this insurance during the summer months, irrespective of their registration for that part of the year. For further information, consult the Insurance Office, Room 427, University Hall.

If a student presents evidence of insurance in force which provides him equivalent coverage, he may petition the University Insurance Office for a refund of this fee. Refunds are not made on any other basis. The student should also consult the Insurance Office about the time limit for such a refund petition.

Additional Fees and Charges

One or more of the following additional fees and/or charges will be assessed as applicable.

The Course-Visitor Fee of $15 is assessed all class visitors who are not in Range I in the tuition-and-fee schedule. See *Visitors.*

The Special-Examination Fee of $10 is assessed for a special examination taken in the hope of obtaining credit in a course that has been failed at the University of Illinois. See *Student Handbook* (University of Illinois at Chicago Circle).

The Transcript Fee of $1 is assessed for each additional transcript sent after the first, which is issued without charge.

The Late-Registration Fine of $15 is levied against all students who complete registration after classes have begun.

The Lost-Photo-Identification-Card Fee of $1 is assessed for replacing a lost or destroyed Photo-Identification Card, issued to the student at the time of his first registration at Chicago Circle. The cost for replacing the student Fee Receipt Card alone is $.50.

Deferred Fees

The Deferred-Fee Charge of $2 is made when arrangements have been made with the Business Office to defer payment of fees. This charge, which is nonrefundable, must be paid on the day the agreement is reached, in accordance with the following guidelines.

A personal fee deferment will be granted to any student who does not have a delinquent account with the University. The schedule below reflects the down payment required at registration for the winter quarter It is subject to change without notice.

	Range I 12 Quarter Hours and Above		Range II 5½ through 11½ Quarter Hours		Range III 0 through 5 Quarter Hours	
	Res.	Nonres.	Res.	Nonres.	Res.	Nonres.
Tuition and Fees	$212	$542	$152	$372	$ 91	$201
Minimum Amount Payable at Registration (includes $2 service charge)	$107	$272	$ 77	$187	$ 47	$102
Balance Due 30 Days After Classes Start	$107	$272	$ 77	$187	$ 46	$101

Students holding tuition waivers may not obtain a personal deferment of their fees. Personal deferments are not available to students registering during late registration.

Deferred Fees from Illinois State Scholarship Recipients

Students who hold Illinois State Scholarship awards that are less than the total assessed tuition and fees must pay the difference at the time of registration. This difference may be deferred only if written evidence of other University financial aid in an amount sufficient to cover the difference is presented at the time of registration.

Deferred Fees for Students Receiving Other Financial Aid

Students who have other financial aid awards (National Direct Student Loan, Educational Opportunity Grant, or private scholarship) may defer their tution and fees in full if the total of their financial aid award exceeds their tuition and fee assessment. If the financial aid award does not cover the total assessment, the difference must be paid at the time of registration. To obtain full or partial deferment, written evidence of the financial aid award must be presented at the time of registration.

Refunds

Students who withdraw from the University or from a course are, under certain circumstances, entitled to a refund of a portion of the tuition and fees paid. All requests for withdrawals should be initiated in the office of the college in which the student is enrolled.

Refunds on Withdrawals from the University. The student who withdraws *within the first ten days of instruction* is entitled to a refund of the full amount of tuition and fees, *except for the nonrefundable charge.* After the tenth day of instruction, no refund is issued.

Refund on Withdrawal from a Course. If withdrawal from a course results in a reduction in the student's program to a lower tuition-and-fee range, the full difference is refunded during the first ten days of instruction. After the tenth day of instruction, no refund is issued.

Refund on Withdrawal by a Visitor. A full refund will be issued if the withdrawal is made *within ten days after payment of the fee.* Thereafter, no refund will be made.

Refund on Withdrawal to Enter Military Service. When a student withdraws from the University to enter military service, he must be on active duty within ten days after withdrawal in order to receive a refund of tuition and fees. *It is his responsibility* to present proof of his active-duty status. The most effective way of presenting such proof is to have the personnel officer of the unit to which he is assigned certify to the University the date of the student's assignment to active duty.

Full credit is allowed for all courses in which the student has a grade of C or higher and a W, withdrawn without penalty, is recorded for courses in which his grade is below C.

For additional credit information for the student who enters military service, see *Transfer and Withdrawal.*

Transcripts

Each student who has paid all his University fees is entitled to one transcript free of charge. (See *Transcript Fee.*) However, students who are in debt to the University are not eligible for readmission and are not entitled to official transcripts and diplomas until the indebtedness is cleared.

Transcripts of official records are issued only on the request of the student. The Office of Admissions and Records will honor a student's written request to have information other than that which is considered public (i.e. name, date of attendance, curriculum, and degrees and honors earned) released or withheld. The Director of Admissions and Records may, at his discretion, release academic information in order to obtain financial assistance or honors recognition for the student.

Graduation Requirements and Academic Regulations

Regardless of the college and curriculum in which he is enrolled, each student must fulfill these specific requirements if he is to be graduated:

1. He must meet the admission requirements for the requested curriculum.
2. He must remove all deficiencies in entrance credit.
3. He must demonstrate that he is proficient in written English by earning passing grades in English Composition 101 and 102 or by passing a proficiency examination or the equivalent. A transfer student may be certified by the Office of Admissions and Records as having been exempted without credit from the equivalent of English Composition 102 while previously attending a fully accredited institution.
4. He must fulfill the general education requirements of a *minimum* of 9 hours in approved courses in humanities, 9 hours in approved courses in social science, and 9 hours in approved courses in natural science. However, the Colleges and Schools are authorized to increase these minimum requirements. Consult the graduation requirements of the Colleges and Schools for variations. Enrollment in these general education courses is determined in consultation with the appropriate college office and provides a broad educational base for the major and minor (Liberal Arts and Sciences), for a field of specialization (Business Administration), for the selected option (Art and Architecture, Engineering), or for work in the College of Education and the School of Physical Education.
5. He must meet all graduation requirements of the college and curriculum in which he is enrolled.
6. He must earn the required minimum cumulative grade-point average of 3.000 (C), or higher if prescribed in his curriculum, in all work offered for the degree and in all work taken at the University of Illinois.
7. He must satisfy the residence requirement: Either the first 135 quarter hours or the last 45 quarter hours of University work must be taken at Chicago Circle. University of Illinois correspondence and extramural courses neither apply to satisfaction of the residence requirement nor interrupt residence.

For the specific college or school requirements that must also be met, see the appropriate sections of this catalog.

Graduation with Honors

The Chicago Circle Senate and the Board of Trustees establish the criteria under which students are awarded department, college, and University honors.

Department Honors (Departmental Distinction) may be awarded if the student has met the criteria established by the department in which he completes his major and by his college. His diploma and transcripts will carry the designation Distinction, High Distinction, or Highest Distinction, as appropriate.

General College Honors are awarded the student recommended by his dean by virtue of a sufficiently high scholastic average and the fulfillment of scholastic and other conditions determined by the college from which the student will be graduated. His diploma and his transcripts carry the notation of such an award.

Graduation with College Honors benefits the student when he is being considered for a graduate fellowship, an unusual job-placement, or some other competitive opportunity.

The Book of Academic Honors contains the names of those students who have at least a 4.500 cumulative average, from college entrance through the quarter prior to graduation, for all work (exclusive of basic military science and required physical education) taken at the University and who are in the top 3 percent of the students in their college who will be graduated with them. A transfer-student candidate for listing in the Book of Academic Honors must have earned 60 or more quarter hours at Chicago Circle and have a cumulative average and a total cumulative average as high as the lowest average listed for those honors candidates in his college who have completed all their work at Chicago Circle.

Additional prizes and awards are given to both undergraduate and graduating students who have meritorious records.

Degrees

A degree from the University of Illinois is awarded by action of the Board of Trustees on recommendation of the appropriate College and Senate. Degrees are conferred four times a year, at the end of each quarter. The student receives the degree in a stated curriculum. The graduation requirements in effect for a curriculum at the time of the student's admission to it become his graduation requirements unless he elects to meet revised degree requirements that subsequently may apply to that curriculum.

Approval of any necessary substitutions in graduation requirements rests with the college in which the student is enrolled.

The degree for each major is stated, together with the degree requirements, in the appropriate college section in this catalog.

Second Bachelor's Degree

A student in the Colleges of Art and Architecture, Business Administration, or Engineering who completes 45 quarter hours of credit beyond the requirements for a first degree and meets all other requirements, including residency, may receive a second bachelor's degree, which may be earned either concurrently with or subsequent to the first degree. A student in the College of Liberal Arts and Sciences, upon meeting all the departmental course and residency requirements for an additional field of specialization, may receive a letter of certification from the Dean of the College in lieu of the second degree.

Academic Year

The academic year consists of three quarters (Chicago Circle and Medical Center) or two semesters (Urbana). Requirements are generally stated in terms of full-time programs.

Quarter Hours

A University quarter hour represents one classroom hour of fifty minutes weekly for one quarter in lecture or recitation, and either the necessary preparation time or a longer time in laboratory or other work. It is expected that most students will spend two hours of preparation for one hour per week of lecture or recitation. Each University quarter hour of credit is thus understood to represent at least three hours of the student's time, and the credit value of a course is calculated in quarter hours on that basis. The number of quarter hours allotted each course is listed immediately after the course title in the "Courses of Instruction" section. "ENGLISH 101. INTRODUCTION TO POETRY. 4 HOURS." is an example. The number of quarter hours earned by the student determines, during his undergraduate period, his classification within the University:

45 quarter hours—sophomore standing
90 quarter hours—junior standing
135 quarter hours—senior standing

To convert semester hours to quarter hours, multiply by 3/2; to convert quarter hours to semester hours, multiply by 2/3. For example, 45 quarter hours equal 30 semester hours.

The minimum required for a degree is 180 quarter hours. The required number of hours varies within the colleges, schools, and curricula. The student should refer to the section of this catalog that covers his college and curriculum to determine the hours requirement for his particular degree. His college office will also provide this information.

The Grading and Grade-Point Systems of the University

Each student seeking a degree should thoroughly understand the meaning of grades and symbols and the grade-point value of each grade:

Grades	*Equivalent*	*Grade Points per Hour*
A	Excellent	5
B	Good	4
C	Average	3
D	Poor but passing	2
E	Failure	1

Symbols (not included in computation of average)

W—Withdrawn from course without penalty (no grade)
Df—Grade deferred (graduate courses, independent study courses, and certain study-abroad courses only)

S—Satisfactory U—Unsatisfactory
Used in graduate thesis research courses and graduate courses given for zero credit.

P—Pass F—Fail
Used only in courses taken under "Pass-Fail" option. See *Pass-Fail Option* in the College of Liberal Arts and Sciences.

In—Incomplete. May be assigned if (1) the student is absent from the final examination and excused by the instructor; (2) he has incomplete course work; (3) he is absent from the final examination. An In grade must be removed by the end of the student's second quarter in residence, subsequent to its incurrence, or, if the student is not in residence, it must be removed by the end of the calendar year subsequent to the incurrence. An In that is not removed by the deadline will automatically be revised to a grade of E.

Pass—Used for proficiency examinations and special examinations.

Fail—Used for special examinations.

Computing the Grade-Point Average (for applying college probation and drop rules). Multiply the number of hours for each grade by the weight, add the products, and divide by the total number of hours. For example:

Grade	*Hours*	*Weight*	*Grade Points*
A	4	5	20
B	6	4	24
C	5	3	15
	15		59

The grade-point average is 59/15 or 3.93.

Registration as a Vistor

The privilege of attending classes as a visitor is granted on and after the first day of instruction and only by the instructor of the class with the approval of the dean of the college concerned. Registration forms may be obtained from the Office of Admissions and Records, Room 1-120 Library. Visitors are not permitted in laboratory, military, or physical education classes.

A visitor is not allowed to write an examination (including a proficiency examination) for course credit nor to participate in class activities.

A registered student on a full-fee schedule or a person who is a permanent, nonacademic employee of the University does not pay a visitor fee. See *Tuition and Fees.*

Transfer and Withdrawal

Transfer to and from Urbana-Champaign is governed by specific regulations. See *A Readmission Applicant.* Since Urbana-Champaign is on the semester system and Chicago Circle is on the quarter system, such transfer is most easily made at the end of an academic year. Any undergraduate student in good academic standing at the Chicago Circle campus or the Urbana-Champaign campus shall be admitted to the undergraduate college on the *other* campus, provided he meets the requirements of the college to which he is applying as an intra-campus transfer. Admission will be kept open each term until all spaces are filled. For information regarding intra-campus transfer the student should consult the Office of Admissions and Records at his present campus.

Admission to the Colleges at the Medical Center (Graduate, Medicine, Dentistry, Nursing, and Pharmacy). Application must be made on official application blanks obtained from the Office of Admissions and Records of the University of Illinois at the Medical Center, 1737 W. Polk Street, P.O. Box 6998, Chicago, Illinois 60680.

Withdrawal from the University is also governed by specific regulations that the student should observe to protect his academic standing. Failure to do so will result in a grade of E (failure) in each course in which he is registered appearing on his record. A student who wishes to withdraw should initiate official withdrawal action in the college in which he is enrolled. Withdrawal initiated during the final ten days of instruction requires submission of a petition in addition to the application for readmission if a student subsequently wishes to return to the University.

A student who has been charged with an offense that may result in disciplinary action may not officially withdraw from the University until the hearing of his case has been conducted by the appropriate disciplinary committee.

Withdrawal to Enter Military Service. If withdrawal occurs during the first five weeks of instruction, the student does not receive any academic credit. If withdrawal occurs during the sixth to eighth weeks (inclusive), he will receive

one-half credit in those courses in which his grades are C or better at the time of withdrawal and W (withdrawn without penalty) in those courses in which his grades are below C. After the eighth week, full credit is allowed for all courses in which he is earning C or better, and W is recorded for courses in which he is receiving grades below C.

The above regulations are effective *only* if the student goes on active duty within ten days after the withdrawal, and it is his responsibility to present proof of that fact. The most effective way of presenting such proof is to have the personnel officer of the unit to which he is assigned certify to the University the date of his assignment to active duty.

For regulations governing refunds to the student who enters Military Service, see *Refunds.*

Student Affairs

Oscar Miller, M.A., Dean of Student Affairs
Weyman L. Edwards, M.Sc., Assistant Dean of Student Affairs
Ronald L. Owens, B.S., Assistant Dean of Student Affairs; Director of Veterans Affairs
George M. Safford, B.A., Assistant Dean of Student Affairs
Warren O. Brown, B.S., Associate Dean—Dean of Men
Marie L. Johnson, Ph.D., Associate Dean—Dean of Women
Barbara Roy, M.Ed., Assistant Dean
Robert E. Mahoney, M.S., Director, Financial Aid
Phillip G. Baugher, B.A., Assistant Director, Financial Aid
Christel McDowell, B.S., Assistant Director, Financial Aid
Elise Sanford, B.A., Assistant Director, Financial Aid
Benny E. Starks, B.S., Assistant Director, Financial Aid
Laurette A. Kirstein, M.S., Director, Foreign Student Affairs
Kenneth W. Phifer, D.M., Assistant Director, Foreign Student Affairs
Vidvuds Medenis, M.D., Director, Health Service
Roland Q. Swaim, Ed.D., Director, Placement Services
Richard G. Bickhaus, Ed.Sp., Assistant Director, Placement Services
Harold Klehr, Ph.D., Director, Student Counseling Service
Jean H. Baer, Ph.D., Assistant Director, Student Counseling Service
Susan S. Erskine, M.A., Director, Office of Organizations and Activities
Diana Alsberg, B.A., Assistant Director, Office of Organizations and Activities

The academic life of the student is supervised by the dean of the college in which the student enrolls; however, the University's interest in the individual extends beyond the classroom to include his personal welfare and his orientation to college life.

Dean of Student Affairs

The Dean of Student Affairs is a major officer of the University. He reports directly to the Chancellor and helps in the formulation of policy that governs student affairs; he also works closely with other members of the administrative staff, with Student Government and other student organizations, and with the faculty Senate Committee on Student Affairs. Under the Dean of Student Affairs are the Associate Dean of Students—Dean of Men, the Associate Dean of Students—Dean of Women, and the Assistant Dean and Director of Veterans Affairs. The Dean of Student Affairs is also responsible for coordinating the activities and functions performed by the Office of Financial Aid, Student Employment, Foreign Student Affairs, Organizations and Activities, Placement, Student Counseling, and the Student Health Service. The Office of the Dean of Student Affairs, along with the offices listed above, serves as the principal point of contact between the individual student, the student organizations, and the University administration. Problems faced by students in their adjustment to the University, including their relationships to each other, to extracurricular activities, to their college offices, to the University police, and to other administrative agencies may be brought to the Office of the Dean of Student Affairs or to any of the above offices for help in their resolution.

Associate Dean—Dean of Men
Associate Dean—Dean of Women

The associate deans and their staffs are available daily for conferences with students or with their parents. These deans also work closely with honor societies and with the various student activities.

The Student Counseling Service

By providing personal counseling, specialized group services, and psychological testing, the Student Counseling Service aims to foster the educational, vocational, and personal development of the student so that he may attain maximum benefits from his educational experiences. It is the privilege of the student to make use of the following services whenever the need arises.

Personal Counseling is offered either on an individual or group basis to any student who seeks help in working through personal concerns and problems and in developing a positive, realistic self-image.

Educational and Vocational Counseling are available to students who may be uncertain about their choice of college, major, or graduate or professional college or who wish to develop and assess their career plans.

Group Services of considerable variety are provided for the student who wishes to improve his reading comprehension and speed, establish better study methods so he can learn with greater ease, analyze and improve his test-taking skills prior to enrollment for college-level achievement tests and graduate school examinations, develop increased facility in vocabulary usage at different levels of communication, define his vocational plans by making use of summer and part-time work experiences, or improve his skills in relating to others in meaningful and mutually satisfying ways.

Freshman Guidance Examinations, followed by a counseling appointment, are offered to all graduating high school seniors who have completed the American College Test (ACT) or the Scholastic Aptitude Test (SAT), one of which is required of applicants for admission to the University. This service, which is provided to Illinois residents, has no bearing on the applicant's eligibility for admission.

Pre-Entry Counseling is offered to the graduating high school senior or to the transfer student to help him determine the college and the curriculum of the University that best meet his needs, to formulate his educational and vocational goals, and to clarify his thinking on how to make a good start in his college work.

Individual and Group Tests are offered to registered students in support of educational, vocational, and personal counseling. In addition, the student interested in taking various national examinations for admission to graduate and professional colleges may wish to consult with the Student Counseling Service.

Test Scoring Service, which offers faculty members facilities for rapid scoring of tests and analyzing test items, also benefits students by contributing to the improvement of classroom teaching and the evaluation of instruction.

The Speech and Hearing Clinic, under the auspices of the Student Counseling Service, provides, free of charge, facilities for hearing testing, diagnostic speech and voice evaluations, and correction of speech problems. Students who wish assistance in correcting speech difficulties, including those arising from foreign accents, hearing impairments, and voice or articulation problems should avail themselves of the services of this clinic, located in 202 Grant Hall.

Student Health Service

Better physical and mental health for the students at Chicago Circle is the goal of Health Service doctors, who are experienced clinicians, most of whom have practiced for years as family physicians or specialists.

The professional staff consists of nine physicians: internists, generalists, psychiatrists, a dermatologist, a surgeon, and a gynecologist. Three psychologists, two nurses, and a biochemist are also on the staff. Laboratory, X-ray, and ECG services are available.

The student health fee of $5 per quarter covers 85 percent of the total operational expenses of the Health Service.

Medical examinations are required of all students before their first registration. The examination is made by the family physician at the student's expense.

The University Health Service provides ambulatory clinic services for both preventive medicine and treatment. The cost of most medical expenses that cannot be assumed by the Health Service is covered by the student Hospital-Medical-Surgical Insurance, supervised by the Insurance Division of the Office of Business Affairs, at a cost to the student of $10 per quarter.

Beds for the temporary day care of ill students are provided. However, the University does not provide hospital care for its students, the large majority of whom are from families living in the Chicago area. Cases requiring bed care are referred to the student's family doctor and to hospitals of the community.

Financial Aid

Illinois State Scholarship Commission Monetary Awards

These grants and scholarships are not awarded by the University of Illinois but by the Illinois State Scholarship Commission (ISSC). Students must file a *separate* application *directly* with ISSC. High school students may obtain these forms from their counselors. Others, including enrolled UICC students, may request the ISSC form from the Office of Financial Aid. Illinois State Scholarship Commission monetary awards cover all or part of a student's tuition and fees, but no other costs at UICC.

Approximately 35 percent of UICC undergraduate students annually receive ISSC monetary awards. *All* incoming UICC students and *all* continuing UICC students are strongly urged to apply to the ISSC for assistance, including those continuing UICC students who hold state tuition waivers (such as General Assembly, Teacher Education, and Military). In most cases, ISSC awards *exceed* the value of tuition waivers.

University-Administered Financial Aid

Financial aid for undergraduate students at the University of Illinois at Chicago Circle includes grants, scholarships, tuition waivers, loans, and employment, which the student applies for and receives through the Office of Financial Aid, located on the 13th floor of University Hall. Certain colleges of the University have limited scholarship funds that they award separately.

The Office of Financial Aid requires the Family Financial Statement of the American College Testing Program (ACT), together with the UICC Application for Financial Aid. For students *new* to the University, the Parents Confidential Statement of the College Scholarship Service (CSS), together with the UICC Application for Financial Aid, is acceptable. May 1 is the deadline for students who are enrolling for the first time to submit the required financial aid documents; April 1 is the deadline for continuing UICC students to submit financial aid documents.

Grants

Basic Educational Opportunity Grant (BEOG): This program is *new,* beginning with the 1973-1974 academic year. These grants will be awarded to students on the basis of expected family contributions, as established by the U.S. Commissioner of Education. These conditions must be met:

1. The student must be a citizen of the United States or a resident alien.
2. The student must be an undergraduate, capable of making satisfactory progress in the University.
3. The student may be enrolled either full-time or part-time; but the amount of the grant will vary with the student's tuition-and-fee range.
4. The amount of the BEOG cannot exceed *one-half* of the cost of attendance, as determined by the Commissioner, nor more than $1,400 per year.
5. The student may receive the grant for up to five years of undergraduate study, providing the student's program reflects an additional year of remedial or preparatory study. Ordinarily, the grant will be awarded for no more than four years of undergraduate study.

Supplementary Educational Opportunity Grant (SEOG): These grants are awarded only to students from families with very low incomes and few assets and according to very strict guidelines set by the U.S. Office of Education.

1. The student must be a citizen of the United States or a resident alien.
2. The student must be an undergraduate, capable of making satisfactory progress in the University.
3. The student must be enrolled at least half-time (8 quarter hours per term), but the amount of the grant will vary with the student's tuition and fee range.
4. The amount of the SEOG cannot exceed one-half of the financial aid award made to an individual student by the institution, state agency, or private organization and cannot exceed $1,500 in any one year and no more than $4,000 for the usual four years of undergraduate study.
5. The student may receive the grant for up to five years of undergraduate study if the institution determines that a fifth year of study is necessary for the student to complete his undergraduate degree.

Law Enforcement Education Program Grants (LEEP Grants): For full-time law enforcement officers only, these grants range *up to* $200 per quarter and are designed to cover part of the costs of tuition, fees, and books. LEEP loans are available to full-time law enforcement officers attending classes full-time to cover certain additional educationally related costs. The UICC Application for Financial Aid is required, but *not* the financial statement (ACT/CSS). Funds in this program are limited.

Grants in Aid

Thomas R. Bump Grants In Aid. Up to $300 per year; to assist underachieving and underprivileged ghetto students.

Carson, Pirie, Scott & Company Grants In Aid. For designated employees of Carson, Pirie, Scott & Company; usually in the amount of tuition and fees.

John W. Page Foundation Grants In Aid. For students in financial need who do not meet scholastic requirements for awards from other scholarship funds; amount varies.

Alice D. Taylor Grants In Aid. For undergraduate students who demonstrate financial need; the amount varies.

University Scholarships

Limited in number and amount, these scholarships are awarded to students with good academic records who can *also* demonstrate need. Funds come from a variety of sources, and some have specific conditions that must be observed in awarding them.

1. Scholarships are awarded to eligible sophomores, juniors, and seniors. If funds are available after these awards are made, freshmen are considered.
2. Applicants must be United States citizens or resident aliens and must usually have a grade-point average of 3.750 or better on a 5.000 scale; some scholarships have higher grade-point average requirements.
3. Some scholarships have been reserved by the donors for students in specific fields of study, such as architecture, art, business administration, engineering, and social work.
4. Scholarships are awarded in various amounts, usually ranging between $200 and $700 but some permit larger awards.
5. Students may hold more than one scholarship if the wording of the scholarship permits.

Applications for the scholarships listed below may be obtained in the Office of Financial Aid.

Scholarships Not Restricted to a Specific College or Department.

Albert Bellamy General Cash Scholarships. For students in any curriculum; $150 to $400 each.

Henrietta Curtis Hill Braucher Memorial Scholarships. From a bequest in the will of the late Ralph W. Braucher; amount varies.

Granite City Steel Company Scholarships. For undergraduate, graduate, and professional students in environment-related study and research; amount varies.

Bertha L. Compton Memorial Scholarship. For a young man or women of good character who is not a member of a fraternity or a sorority. The recipient must agree to repay to the fund as soon as he conveniently can; $100 to $400.

Educational Opportunity Scholarships. Small scholarships, in varying amounts, used primarily as matching funds for Educational Opportunity Grants, are provided from a fund supported entirely by individual donors.

Wensel Morava Scholarships. For young men and women between 17 and 22 years of age and of good health and good character. Applicants must be members of a church or Sunday school and must agree not to join a fraternity or sorority during their first two years as recipients. Applicants also must agree to assist, as alumni, a student with his or her expenses at the University if they are financially able to do so. Preference is given to students of Czechoslovakian descent; $100 to $600.

Lucille E. Morf Scholarships. General scholarships, in varying amounts, for students in any curriculum.

National Council of Jewish Women Scholarship. Awarded annually to a junior or senior in the College of Liberal Arts and Sciences. The student must be concerned about current social issues in the United States and must be preparing for a career related to constructive dealing with such issues. Preference will be given to applicants residing in Evanston or Niles Townships; $400.

LaVerne Noyes Scholarships. Awarded to students who are direct descendents of American veterans of World War I; tuition and fees.

Eric H. and Ruby V. Peterson Scholarships. General scholarships, in varying amounts, for students in any curriculum. Preference is given to students from Rockford, Illinois, and vicinity.

James D. and Clara Phillips Scholarships. General cash awards for students in any curriculum; $150 to $200.

Regensteiner Corporation Scholarships. Awarded annually by the Regensteiner Corporation as a good-neighbor gesture; three scholarships of $300 each.

Gretchen Johanna and Paul Charles Schilling Scholarships. For students in any curriculum; maximum of $500 each.

Lindsey Ter Bush Memorial Scholarship. Awarded to a student in any curriculum; amount varies.

University Club Foundation of Chicago Scholarships. For students in any curriculum.

Etta and Laura Beach Wright Scholarships. For students in any curriculum; two scholarships of $250 to $300 each.

Scholarships Restricted to Specific Colleges and Departments.

College of Architecture and Art

Lydia E. Parker Bates Scholarships. For students in architectural engineering, architecture, art, landscape architecture, and urban planning; the amount varies.

A.M. Kinney and Associates Scholarship. For a student enrolled in the College of Architecture and Art; $250.

Leon Weisberg Memorial Scholarship. Established in memory of a former student at the University of Illinois at Chicago Circle and awarded to a junior or senior majoring in architecture; $400.

See also Theodore R. Schlader Memorial Scholarships and Women in Construction Scholarships under College of Engineering.

College of Engineering

Deloris Wade Huber Scholarships. Varying amounts for students in civil engineering.

Link Belt Educational Scholarships. Derived from the income received from Link Belt Company stock given to the University of Illinois Foundation by an anonymous donor. Preference is given to students enrolled in engineering or business administration curricula; $350 to $1,000.

Calvin Barnes Nicholls Memorial Scholarships. For male students at any class level in any field of engineering; $350 to $1,000.

Theodore R. Schlader Memorial Scholarships. For students in architecture, architectural engineering, electrical engineering, or other engineering fields; $300 each.

Frederick D. Secor Memorial Scholarships. For students in electrical engineering; $200 to $300 each.

Women in Construction Scholarships. Given annually by two women's organizations to junior or senior men or women who are enrolled in architecture or engineering; covers tuition, fees, books, and supplies.

Leigh F. J. Zerbee Scholarships. For students in civil engineering who are also enrolled in military science; maximum of $500.

College of Liberal Arts and Sciences

Chicago Circle Physics Scholarship. Provides limited financial assistance to

students of at least junior standing in one of the physics curricula; awarded upon recommendation of the Department of Physics.

Dr. Hartwell C. Howard Memorial Scholarships. For premedical and predental students; $250 to $500.

Scholarships Administered by the Colleges and Departments

College of Business Administration

Alpha Kappa Psi Scholarship. Awarded to the highest ranking male student in business administration.

Chicago Perfumery, Soap and Extract Association, Inc., Scholarship for students in the College of Business Administration except those majoring in accounting. Recipients are chosen by a faculty committee. Financial need will be considered in awarding this scholarship; $350.

Ernst and Ernst Scholarship for students majoring in accounting. Recipients must show evidence of outstanding ability and potential. Personal financial need is not a factor. One annual scholarship; $500.

Winifred Geldard Scholarship for students majoring in economics. To be eligible a recipient must have a cumulative grade-point average of 4.250 or better. Scholarship, ability, and potential shall be the major factors, not necessarily in that order. Need shall not be considered as the major factor in selecting the winner. One annual scholarship; $400.

Haskins and Sells Scholarship for students majoring in accounting. Recipients must show evidence of outstanding ability and potential. Personal financial need is not a factor. One annual scholarship; $300.

S.D. Leidesdorf and Co. Scholarship for students majoring in accounting. Recipients must show evidence of outstanding ability and potential. Personal financial need is not a factor. One annual scholarship; $500.

Link Belt Educational Scholarships. Derived from the income received from Link Belt Company stock given to the University of Illinois Foundation by an anonymous donor. Preference is given to students enrolled in engineering or business administration curricula; $350 to $1,000.

John S. Schweppe Scholarship. For a student enrolled in the College of Business Administration; amount varies.

College of Engineering

Industrial Scholar Scholarships. Juniors and seniors with high scholastic achievement in the College of Engineering are eligible for these cash awards, funded by a number of industries in the Chicago area.

Robert E. Kennedy Scholarships. For students interested in the foundry field. An applicant must demonstrate financial need and must be of good character, good health, a citizen of the United States and enrolled in a mechanical, electrical, or other engineering curriculum related to the foundry industry. A candidate must show laboratory proficiency and scholastic achievement in subjects allied with the foundry field, thereby indicating a potential promise for work in that industry; amount varies.

College of Liberal Arts and Sciences

Raffeld Family Scholarship. Awarded annually to a student majoring in the Department of Speech and Theater; $200.

Jane Addams School of Social Work

Patricia Ann Counce Memorial Scholarship. A grant, in the amount of tuition and fees, for a woman student of disadvantaged background who intends to enter the field of social work; up to $500.

Tuition Waivers

These waivers are deductions from the student's bill in the exact amount of his tuition costs; *no fees* are covered. All tuition waivers awarded by the Office of Financial Aid are based on the student's financial need. *Very few* tuition waivers are available, particularly to foreign students.

To be considered for a tuition waiver a student must have applied for assistance to the Illinois State Scholarship Commission. If the student is denied aid by the ISSC for either of the following reasons, he will be considered for a University tuition waiver:

1. He has been denied by the ISSC because he has used up his eligibility (more than twelve quarters in attendance).
2. He has been denied by the ISSC for *non-financial* reasons, such as non-residency or ineligibility for independent status.

A student who has been denied by the Illinois State Scholarship Commission for financial reasons will not be considered for a University tuition waiver.

Illinois Military Tuition Waivers do not require that an applicant file for financial aid. To be eligible the veteran must have served honorably for not less than one year unless he was discharged in less than one year for medical reasons. He must have been a resident of Illinois for not less than six months before he entered service, and he must have resided in Illinois for not less than one year before he applied for the waiver. More complete information is available in the Office of Financial Aid, Room 1331, University Hall.

Loan Assistance

To be eligible for a loan awarded by the Office of Financial Aid, the student must prove financial need, unless he is applying for a LEEP loan, which is available under specific conditions.

National Direct Student Loan (NSDL) This loan replaces the National Defense Student Loan.

1. The student must be a citizen of the United States or a resident alien.
2. The student may borrow up to a *total* of $5,000 as an *undergraduate.* Ordinarily, students will be permitted to borrow as much as $1,000 per academic year, but this amount may be exceeded under certain circumstances, and as long as the total undergraduate limit is not exceeded.
3. Repayment does not begin until nine months after the student has left the University. Interest at 3 percent per year does not begin until repayment begins.
4. A student has up to 10 years to repay his loan, but a minimum monthly or quarterly payment may be required.
5. If a student transfers to another school, enrolls in graduate school, or enters military service, the Peace Corps, or Action Corps (formerly VISTA), repayment on his loan is deferred (upon his request). At the time the student leaves UICC, more complete information about deferment possibilities is discussed.
6. Under certain conditions part of the student's loan can be cancelled. The specific provisions for cancellation are detailed in the promissory note signed by the student.
7. The student must be enrolled at least half-time (8 quarter hours per term), but the amount of the loan will vary with the student's tuition and fee range.

University Long-Term Loan (ULT)

1. The student must be enrolled at least half-time (8 quarter hours per term), and making satisfactory progress.
2. There is no citizenship requirement, but the student must arrange for a cosigner acceptable to the University's Office of Business Affairs.
3. The student may borrow up to $5,000 as an undergraduate, but not more than $1,000 in any academic year.
4. The loan is to be repaid over a period of four years, beginning four months after the student leaves the University.

Illinois Guaranteed Loan (IGL)

Funds for these loans are *not* provided through the University or by the Office of Financial Aid but by participating banks and other lending institutions. Applications for the Illinois Guaranteed Loan may be secured from the Office of Financial Aid.

Because of certain changes being made in this program, no additional information can be offered at this time.

Law Enforcement Education Loans (LEEP)

The loans are made to full-time law enforcement officers and to undergraduate and graduate students interested in a career in criminal justice. However, funds in this program are limited, with many more applicants than there are available monies to fund them.

1. Loans range up to $1,800 per year, with 25 percent of the loan cancelled for every year the student subsequently works in the field of law enforcement.
2. Loans that cover the costs of tuition, fees, books, and transportation do not require that the student file a financial statement, but he must file the UICC Application for Financial Aid.
3. Loans to cover costs beyond those stated in item 2, above, *do* require that the student submit the complete application set.

Short-Term Loans

These loans are made for emergency educational expenses up to $100. They are made only through the Offices of the Associate Deans (Dean of Men and Dean of Women) and Assistant Deans of Student Affairs. They cover general emergency situations that require no more than $15 at one time.

1. They are repayable in 45 days or by the end of the quarter in which the loan is made.
2. Graduating seniors may borrow up to $200 for expenses related to employment interviews.
3. No interest is charged, but there is a $1 fee for processing.

Awards and Prizes

Emerson F. Schroeder Awards. For students in any curriculum. One or two annual awards; from $150 to $300 each.

College of Architecture and Art

Edward M. Cohon and Associates Prize. For architecture students who are majoring in structures.

Henry M. Dubin Prize. For architecture students who are majoring in design.

Women's Architectural League, Chicago Chapter, Prize. For three students who submit outstanding theses in Planning—$150.

College of Business Administration

Ernst and Ernst Achievement Award. For a student majoring in accounting. Selection is made by the Department of Accounting faculty on the basis of scholarship, ability, and potential as a professional accountant—$500.

Financial Executives Institute, Chicago Chapter, Award. A wrist watch is awarded annually to a student in accounting who evidences outstanding ability and potential.

College of Engineering

Bell Honors Award. Each quarter, the graduating student who has attained the highest overall grade-point average in the College of Engineering is cited for this award. His name is engraved on the brass locomotive bell that was brought to Chicago on February 10, 1951, for the observance of the Illinois Central Railroad's 100th birthday; the bell was presented to the College of Engineering by the Railroad.

The following organizations also have contributed awards:

Calumet Chapter—American Society for Metals.
G.T.E.—Automatic Electric Laboratories, Inc.
Bodine Electric Company.
Foundry Educational Foundation.
Motorola, Inc.
Women's Auxiliary of the American Institute of Mining Metallurgical and Petroleum Engineers, Chicago Chapter.
Zenith Radio Corporation.

College of Liberal Arts and Sciences

Department of Biological Sciences

Louis Pasteur Award. For excellence in biological sciences. This award is presented annually by the Honors Committee of the Department of Biological Sciences to a graduating senior who has demonstrated excellent scholarship in biology and outstanding initiative and creativity in the exploration of a specialized research problem.

Department of Chemistry

B.B. Freund Award. For excellence in chemistry.

Department of English

Ernest C. Van Keuren Award. For excellence in the humanities.

Department of History

The Gordon Lee Goodman Award for Distinction in Undergraduate Studies in History. Friends and relatives of the late Gordon Lee Goodman, associate professor of history at the University of Illinois at Chicago Circle, have established a fund in his memory "to support excellence in the undergraduate program in history." Annually the Department of History at Chicago Circle designates at least one and not more than four Gordon Lee Goodman Scholars in History. The student must have attained or be about to attain senior standing, must be a major in history, and must have demonstrated excellent scholarship in the discipline. Designation as a Gordon Lee Goodman Scholar in History carries a stipend that will be paid from the income of the memorial fund. The Department of History maintains a permanent record of all who have been named Gordon Lee Goodman Scholars in History and will identify students so named in all appropriate University announcements and publications.

Department of Physics

Roscoe E. Harris Award. For excellence in physics.

Dean of Women

Alpha Lambda Delta National Council Award. Made to the highest ranking senior in the chapter.

Student Employment

The Office of Student Employment, as a division of the Office of Financial Aid, administers the federal College Work-Study Program. A significant part of on-campus student employment, as well as some off-campus employment, is under the Work-Study Program. A student interested in employment in general, and in the Work-Study Program in particular, should contact the office four to six weeks before the date he will be available for employment. Completed financial aid forms are mandatory for all students participating in the Work-Study Program, and appointments are subject to yearly reconsideration and renewal.

Counseling for the Work-Study Program and for students with special employment problems is provided.

Liaison between prospective employers and students desiring full, part-time, or seasonal employment is provided by this office. Placement through the office includes all on-campus, off-campus, and work-study job opportunities. The listings on file in the Job Center encompass a wide variety of jobs, wage rates, and schedules to meet student needs. Employment in special programs or projects for marketing, English, engineering, and science majors, to indicate a few, is also offered.

The Office of Financial Aid will be pleased to hear from students interested in the types of financial aid described above. Students are invited to contact the office by telephone, in person, or by mail.

The Office of Financial Aid
1301 University Hall
The University of Illinois at Chicago Circle
P.O. Box 4348
Chicago, Illinois 60680
Telephone: 996-3126

Placement Services

Seniors and graduate students are entitled to assistance from the Placement Services Office in determining vocational objectives, choosing careers, and finding permanent employment. Graduating seniors and graduate students are encouraged to register with Placement Services for aid in contacting employers and for planning and scheduling interviews with those business firms, government agencies, and nonprofit organizations whose representatives visit Chicago Circle during the four quarters. The Placement Services Office also serves prospective graduates by making available lists of employment opportunities and directories and by providing vocational counseling and assistance in communicating with potential employers. In addition, an up-to-date career library is maintained.

Seniors who are majoring in teacher education and who will be graduated in March, June, or August should register with Placement Services during the fall quarter. December graduates should complete registration during the preceding summer quarter. In all cases, teacher education seniors should register before they begin student teaching.

All other seniors receive reminders of the availability of placement services by mail; however, any senior who will be granted a degree within *one year* may call 996-2300 or come to Room 4061 Behavioral Sciences Building for career information. Students should start career planning *early* in their last year at the University in order to be available for interviews throughout the year, inasmuch as the bulk of on-campus recruiting is usually completed before Easter. Men who anticipate military service should register and interview during the senior year, even though they face prospective induction.

The aims of the Placement Office are (1) to assist the University graduate in making a wise and responsible choice of a career that will bring him the greatest satisfaction, (2) to eliminate wasteful turnover, and (3) to assist the graduate in achieving the most fruitful long-term investment of his talents for himself, for his employer, and for society.

Veterans Affairs

The number of veterans attending the University of Illinois at Chicago Circle is increasing; therefore, to improve its services to returning veterans, the University has established the position of Assistant Dean and Director of

Veterans Affairs in the Office of the Dean of Student Affairs. Veterans with questions or problems concerning federal or state veterans benefits, employment, housing, tutoring, financial assistance, counseling, and so forth are directed to Room 809 University Hall, telephone 996-5141.

Foreign Student Affairs

The Office of Foreign Student Affairs assists persons of foreign backgrounds in evaluating their abilities, planning their programs, and interpreting regulations appropriate to them. This service includes counseling and help with problems of visa extensions, permanent residency status, and border crossing, as well as information about finances, finding housing, employment, and course work in English as a second language.

The Office of Organizations and Activities

The Office of Organizations and Activities advises more than 190 registered student organizations. It provides assistance in the organization and registration of organizations and in establishing their structure, financial operations, space reservations, event planning, record keeping, and publicity. Students who wish to join any of the various organizations will find information on the purpose, activities, and membership requirements and the persons to contact in the Office of Organizations and Activities. Students who wish to form new organizations will be assisted by the office staff.

The College of Architecture and Art

Bertram Berenson, M.A. (Arch.), Dean of the College
Edward L. Deam, M.Arch., Associate Dean
Raymond A. Dalton, M.S., Assistant Dean

The College of Architecture and Art serves as a center for study and investigation in the visual and plastic arts and offers professional curricula in architecture and in fine arts. Emphasis is on the creative process within a diversified cultural educational context. The arts are considered within their specialized social provinces as a reflection of the highest aspirations of a contemporary culture and as concrete meaning and purpose to human life. *Principles and methodology are stressed* and act as vehicles for the definition of form and style.

All work submitted by students for credit in any course in any department in the College of Architecture and Art belongs to the Board of Trustees of the University of Illinois, and the University reserves the right to retain, hold, copyright, use, exhibit, reproduce, and publish any work so submitted by any student for credit in any course.

The Department of Architecture

Richard R. Whitaker, Jr., B.Arch., Head of the Department
Kenneth W. Schaar, M.A., Administrative Assistant to the Head

Professors: Rene Amon, Ph.D.; Bertram Berenson, M.A. (Arch.); Felix Candela, *Arquitecto;* Leonard J. Currie, M.Arch.; Edward L. Deam, M.Arch.; Charles B. Genther, B.S.; Robert W. Gerstner, Ph.D.; Donald D. Hanson, M.Arch.; George A. Hinds, M.C.P.; Harold B. McEldowney, B.A. (Emeritus); George J. Megarefs, Ph.D.; Henry L. Mikolajczyk, M.Arch.; Richard R. Whitaker, Jr., B.Arch.; Frederick P. Wiesinger, Ph.D.; A. Richard Williams, M.Arch. (Visiting)

Associate Professors: Anthony J. DeFilipps, B.S.; Michael S. Gelick, M.F.A.; Kenneth D. Isaacs, M.F.A.; R. Thomas Jaeger, M.Arch.; Hinman L. P. Kealy, M.C.P.; Phillip A. Kupritz, M.Arch.; Louis I. Rocah, M.S.; Roger Whitmer, M.S.

Assistant Professors: Bruno Ast, M.Arch.; Elliott E. Dudnik, M.S.; Jon L. Liljequist, J.D.

Lecturers: Leonard Bihler, B.S.M.E.; James Caron, M.B.A.; Michael Carone, B.S.C.E.; Raymond S. Chocholek, B.Arch.; Lloyd D. Gadau, B.Arch.; Ezra Gordon, B.S.; Edward S. Hoffman, B.S.C.E.; Fidel L. Lopez, B.Arch.; John Macsai, B.Arch.; William N. Manhoff, B.F.A.; Louis J. Narcisi, M.Arch.; Lawrence B. Perkins, B.Arch.; Martin W. Reinhart, B.Arch.; Peter Roesch, M.Arch.; Kenneth W. Schaar, M.A.; Kenneth Schroeder, M.Arch.; Donald R. Sunshine, B.Arch.

The curriculum in architecture is structured to provide the student with the initial steps in the lifelong process of qualification required to fulfill the social and technical responsibilities of the architect.

Architecture is the art and science of building to satisfy the environmental needs of man. Within those needs, it is the architect's responsibility to analyze the social, psychological, and physical factors and to translate them creatively, through the act of design, into an appropriate physical environment. Thus, as society evolves, so too does the role of the architect. Today, society has charged architecture with far greater social and physical responsibilities than ever before: responsibilities that are best exemplified by the term "urbanism." The results of poverty, social disorder, and an unaccommodating environment foster social, moral, and economic decay and, eventually, total cultural disintegration.

Inherent in the architect's professional success is the potential of the "good life" for the majority of the world's population and the cultural growth and development of its societies. To achieve this potential, the historical evolution of architecture is presented to the students as a matrix for the social, structural, and aesthetic aspects of the profession. The successful student learns to think for himself, to solve problems, and to see the world around him both as it is and as it could be. The factors implicit in architecture are numerous, weighted, variable, and interdependent. Hence, it is through a balanced, flexible sequence of courses in design, building technology, structures, and the humanities that the student is encouraged to identify and to place into context these many factors.

The first, or foundation, year is common for all students in the department; the second, third, and fourth years provide a common base; the fifth year, during which the student completes his major and minor emphases, offers a maximum of flexibility for a degree program in one of the following:

Architectural Humanities	Design
Building Technology	Structures

The curriculum in architecture requires 248-250 quarter hours for graduation, exclusive of military training and formerly required physical education. See *Requirements for Admission to Undergraduate Study* for the admission requirements of the department. The candidate is then eligible for recommendation for the Bachelor of Architecture in one of the above areas.

Junior College Transfer

Students in a junior college who intend to transfer to the Department of Architecture at Chicago Circle are urged to take the junior college equivalent of the following Chicago Circle courses:

Mathematics 130, 131, 132, 194
English Composition 101, 102
Sociology 100, 276 or 271
History of Architecture and Art 142, 143, 144, 231-238
Physics 101, 102
Art electives (10 quarter hours)
Social science or humanities electives (16 quarter hours)

The Curriculum in Architecture

The program is under review and is subject to change. Students applying for admission should contact the department for details.

First Year

First Quarter

	Hours
Architecture and Art 101—Basic Design I	3
Architecture and Art 111—Visual Communications I	2
Architecture and Art 141—Man and Environment	3
Mathematics 130—Calculus and Analytic Geometry I	5
English Composition 101	4
	17

Second Quarter

Architecture and Art 102—Basic Design II	3
Architecture and Art 112—Visual Communications II	2
History of Architecture and Art 142—History of Architecture and Art I	4
Mathematics 131—Calculus and Analytic Geometry II	5
English Composition 102	4
	18

Third Quarter

Architecture and Art 103—Basic Design III	3
Architecture and Art 113—Visual Communications III	2
History of Architecture and Art 143—History of Architecture and Art II	4
Mathematics 194[1]—Introduction to Automatic Digital Computing	3-5
Sociology 100—Introduction to Sociology	4
	16-18

Second Year

First Quarter

	Hours
Architecture and Art 104—Basic Design IV	3
Architecture and Art 114—Visual Communications IV	2
Architecture 121—Statics and Strength of Materials I	3
History of Architecture and Art 144—History of Architecture and Art III	4
Physics 101—General Physics (Mechanics and Heat)	5
	17

[1]Required for all students who elect a design or humanities major. Structures and building technology majors must substitute Mathematics 132.

Second Quarter

Architecture 101—Architectural Design I	6
Architecture 122—Statics and Strength of Materials II	3
Elective—from History of Architecture and Art 231 through 238	4
Physics 102—General Physics (Electricity, Magnetism, and Waves)	5
	18

Third Quarter

Architecture 102—Architectural Design II	6
Architecture 111—Building Technology I	4
Architecture 123—Statics and Strength of Materials III	3
Physical science elective	4
	17

Third Year

First Quarter

	Hours
Architecture 201—Architectural Design III	6
Architecture 211—Building Technology II	4
Architecture 221—Structural Engineering I	3
Sociology 276—Sociology of Urban Life in Industrial Society	4
	17

Second Quarter

Architecture 202—Architectural Design IV	6
Architecture 212—Building Technology III	4
Architecture 222—Structural Engineering II	3
Elective (social sciences or humanities)	4
	17

Third Quarter

Architecture 213—Building Technology IV	4
Architecture 223—Structural Engineering III	3
Architecture 241—Urban and Regional Planning I	3
Art electives[2]	5
	15

Fourth Year

First Quarter

	Hours
Architecture 203—Architectural Design V	6
Architecture 214—Building Technology V	4
Architecture 224—Structural Engineering IV	3
Architecture 242—Urban and Regional Planning II	3
	16

Second Quarter

Architecture 204—Architectural Design Problems	6
Architecture 215—Building Technology VI	4
Architecture 225—Structural Engineering V	3
Elective—from History of Architecture and Art 231 through 238	4
	17

[2]Structures and building technology majors must substitute Mathematics 195 for 3 hours of art electives.

Third Quarter

Architecture 226—Structural Engineering VI[3]	3
Art electives	5
Elective—from History of Architecture and Art 231 through 238	4
Elective (social sciences or humanities)	4
	16

Fifth Year

The fifth year is elective except Architecture 343—Professional Practice. The student will take 6 hours in his elected major in the first and second quarters and will prepare a thesis in his third quarter.

First Quarter

	Hours
History of Architecture and Art 231 through 238, 331, 332[4]; Architecture 301, 312, 313, 314, 321, 322, 323, 331, 332. These courses cover the major emphases; the student enrolls in those pertinent to his option for a total of	12
Elective (social sciences or humanities)	4
	16

Second Quarter

History of Architecture and Art 231 through 238, 332, 333[4]; Architecture 309, 311, 315, 316, 324, 325, 326, 331, 332. These courses cover the major emphases; the student enrolls in those pertinent to his option for a total of	12
Architecture 343—Professional Practice	3
	15

Third Quarter

Architecture 309 or 319 or 329 or 339—Thesis in the student's option.	12
Elective (social sciences or humanities)	4
	16

Notes: For course descriptions, see *Courses of Instruction.*

General Education: A minimum of 9 hours in the social sciences and 9 hours in the humanities is required of all degree candidates.

Courses in the College of Engineering can be substituted for equivalent structures courses in the Department of Architecture if the student's adviser consents.

[3]Comprehensive project for non-structures majors; structures majors must substitute Mathematics 220, Elementary Differential Equations.

[4]For students in architectural humanities.

The Department of Art

Edward Colker, B.S., Chairman of the Department
John H. Pacyna, M.F.A., Administrative Assistant

Professors: Nancy D. Berryman, Ed.D.; Edward Colker, B.S.; Roland F. Ginzel, M.F.A.; Martin R. Hurtig, M.S.; Richard Koppe; Alfred P. Maurice, M.A.; Robert W. Nickle, B.A.; John F. Richardson, M.A.; Simon Steiner, M.S.; John E. Walley.

Associate Professors: Morris Barazani; Leon Bellin, M.A.; Wayne A. Boyer, M.S.; Edward E. Burr, B.F.A. (Emeritus); Eugene Dana, M.Des.; Donald P. Dimmitt, B.S.; Joseph D. Jachna, M.S.; Jerald W. Jackard, M.A.; Keith A. Morrison, M.F.A.; Nancy R. Stableford, M.F.A.; Tadao Takano, B.S.; Charles Wilson, M.F.A.

Assistant Professors: William S. Becker, M.F.A.; Suzanne R. Cohan, M.A.E.; Raymond A. Dalton, M.S.; Klindt B. Houlberg, M.A.; John H. Pacyna, M.F.A.; Lawrence Salomon, B.F.A.; Daniel Sandin, M.S.; Hans K. Schaal, M.S.; Irene Siegel, M.S.; Herbert D. Slobin, M.S.; Robert W. Stiegler, B.S.; Guenther Tetz, M.F.A.

Instructors: Basil T. Argeropolos, M.F.A.; Laura Ann Kiviat, M.F.A.; Dennis A. Kowalski, M.F.A.; George Wead, M.A.

Lecturers: Maureen Felix-Williams, M.A.; Earnest McBurrows, M.F.A.; Hugo W. McCauley, B.S.; Marguerite Munch, M.F.A.; Elmer R. Pearson, B.S.; Allen E. Porter; Irving Titel, B.F.A.; Frank S.H. Vaccaro, M.F.A. (Visiting); Esther P. Wilson, M.F.A.

The artist has the task of providing insights into and meaning for events and of giving form to the objects that compose the physical environment. To do this he must be familiar with the ideas and dilemmas of his time, and he must be capable of using the tools that are necessary to make creative statements.

The program of the Department of Art is designed to stimulate the student's creative activity, to heighten his intellectual capabilities, and to develop the essential skills for acting effectively in a technological industrial society.

For the Bachelor of Arts, 194 quarter hours are required.

Degree Requirements

I. Foundation Program (28 quarter hours)

Required of all entering freshmen. Appropriate placement in the program is made for transfer students who have less than 24 quarter hours or 16 semester hours of work in two- and three-dimensional basic design courses.

Freshmen are not admitted to the Department of Art in the winter quarter.

First Quarter	*Hours*
Art-Design 100—Man and Environment	4
Art-Design 101—Three-Dimensional Explorations	4
Art-Design 111—Two-Dimensional Explorations	4

Second Quarter

Art-Design 102—Visual Concepts: Three-Dimensional	4
Art-Design 112—Visual Concepts: Two-Dimensional	4

Third Quarter

Art-Design 103—Light Documents	4
Art-Design 113—Signs, Symbols, Images	4
	28

Foundation Program for Transfer Students
Students must have at least 16 quarter hours or 12 semester hours of two- and three-dimensional basic design courses.

This program is offered only in fall and spring quarters.

Art-Design 100—Man and Environment	4
Art-Design 200—Three-Dimensional Orientation	4
Art-Design 201—Two-Dimensional Orientation	4
	12

II. General Education (64 quarter hours)
Required of all students, except art education majors.

		Hours
English Composition 101, 102		8
Courses in the humanities[1]	Minimum of	8
Courses in the physical and natural sciences or mathematics	Minimum of	8
Courses in the social sciences	Minimum of	8
General education electives outside of the College of Architecture and Art		32
		64

General education courses for art education majors

English Composition 101, 102	8
Speech 100, 101	5
Psychology 100	4
Political Science 151	4
Social science elective	4
Physical or natural science elective	8
Humanities[1] (History of Architecture and Art 142, 143, 144 are required and may also count as College electives)	(12)
General education electives outside of the College of Architecture and Art	12
	45

[1]Up to 12 quarter hours may be taken in the history of architecture and art to fulfill the humanities requirement.

Professional courses for art education majors

Education 170, 210, 230 or 235, 250	16
Education 270, 271 (Same as Art-Design 284, 285)	16
	32

III. The Major

Design Curriculum—Communications design, industrial design, photo-film design (96 quarter hours)

A student may specialize in one of the design majors above.

48 quarter hours in the major[1]
28 quarter hours in courses related to the major as determined by the student's adviser
20 quarter hours of elective courses in the College of Architecture and Art

Plastic and Graphic Arts Curriculum—Painting, printmaking, sculpture (96 quarter hours)

A student may specailize in one of the plastic and graphic arts majors above.

48 quarter hours in the major[1]
28 quarter hours in courses related to the major as determined by the student's adviser
20 quarter hours of elective courses in the College of Architecture and Art

Comprehensive Curriculum—Emphasis on combining either design courses or plastic and graphic arts courses (96 quarter hours)

76 quarter hours of design or plastic and graphic arts courses[1]
20 quarter hours of elective courses in the College of Architecture and Art

Art Education Curriculum (83 quarter hours)

63 quarter hours of course work in design and plastic and graphics arts; breadth is suggested. Students must include Art-Design 281 and Art-Design 282[1]
20 quarter hours of elective courses in the College of Architecture and Art

[1]Must include 12 quarter hours of 300-level course work.

The Department of History of Architecture and Art

Professors: John D. McNee, M.A., Chairman; H. F. Koeper, Ph.D.

Associate Professors: Donald L. Ehresmann, Ph.D.; David M. Sokol, Ph.D.

Assistant Professors: Ross Edman, M.A.; Dorinda Evans, Ph.D.; Carol LaBranche, Ph.D.; Carroll W. Westfall, Ph.D.

Instructors: Devin Burnell, M.A.; Jethro M. Hurt III, M.A.; Francis Steiner, M.A.; George Wead, M.A.; Charles White, M.A.

Lecturers: Ann W. Goodfellow, M.A.

Curriculum in the History of Architecture and Art

For the Bachelor of Arts, 180 hours in required courses in the Department and the College, in general education courses, and in electives. See *General University Requirements.*

Foundation Courses (Freshman year)

12 quarter hours of History of Architecture and Art 142, 143, 144
16 quarter hours in art studio, as follows:
Art-Design 101, 111, 102, 112, or four courses from Art 104, 105, 205, 206, 207

Courses for the Major

40 hours of architecture and art courses at the 200 and 300 levels, 16 hours of which are in one of six areas of concentration and one course from each of three other areas:

Ancient and Classical art	American and Modern art
Medieval and Byzantine art	Oriental art
Renaissance and Baroque art	Architecture

8 hours in the history of architecture
4 hours in oriental art
History of Architecture and Art 291—Art History Tutorial
4 hours from History of Architecture and Art 333, 391, 392
See *Courses of Instruction* section for course descriptions.

A reading knowledge of one modern language, usually French, Spanish, Italian, or German, should be attained by the end of the junior year.

A minor is not required.

Departmental Distinction: A candidate must have a 4.000 all-University grade-point average, a 4.500 grade-point average in history of architecture and art courses beyond the 100 level, and must pass a departmental comprehensive examination.

The College of Business Administration

Irvin L. Heckmann, Ph.D., Dean of the College
William J. Dunne, M.B.A., Associate Dean
Alvin D. Star, Ph.D., Associate Dean
Norman Smith, B.S., Assistant Dean
Reed G. Henninger, M.A., Assistant to the Dean

Accreditation

The College of Business Administration is a full member of the American Association of Collegiate Schools of Business. This association is recognized by the National Commission on Accrediting as the highest official collegiate accrediting agency for business education at the undergraduate and master's levels. Membership in the association is open only to schools and colleges whose intellectual climate insures the offering of programs of high academic quality and whose teaching and administrative staff possesses the qualifications, experience, professional interests, and scholarly productivity essential for the successful conduct of a broad and liberal rather than an unduly specialized baccalaureate curriculum in business administration.

Objective of the Degree Program

The basic objective of the College of Business Administration is to aid the student in finding excitement, satisfaction, and a sense of fulfillment in the exercise of his abilities while at the same time providing him with the broad base of knowledge necessary to meet the challenges of a rapidly changing society. This implies the development of basic knowledge, skills, and attributes that are widely transferable and applicable throughout a lifetime: a mastery of the scientific method, skill in communication, an understanding of people and the ability to work with them effectively, an ability to organize resources toward specific ends, an ability to concentrate wholeheartedly on the job at hand until it is completed, an open and flexible mind, and the ability and desire to continue learning both on and off the job. The

curriculum, therefore, includes courses in general education, the various functional fields of business administration, and specialized courses in the selected major field. Each course contributes to this broad base of knowledge as well as to the development of the specialized skills necessary to make a significant contribution in administration.

Graduation Requirements of the College

General Requirements

A minimum of 186 quarter hours, exclusive of the formerly required hours in physical education and hours in basic military science, is required for the Bachelor of Science offered by the College of Business Administration.

A grade-point average of at least 3.000 (C) must be earned in each of the following to qualify for graduation credit:

A. All courses taken at Chicago Circle.
B. All Chicago Circle courses counted toward the degree.
C. All courses (Chicago Circle and transfer) counted in the major toward the degree.
D. All courses (Chicago Circle and transfer) counted toward the degree.

The student must also meet all University requirements for the degree as stated in this catalog.

A dual-major degree may be earned by fulfilling the degree requirement in two departments and the College and University requirements; the extra credits required for such a degree depend upon the departments involved. The designation of the dual major will not appear on the diploma, but it will be noted on the student's official record.

The Curriculum

General Education Requirements

English Composition	101 and 102 or the equivalent, 8 hours
Social Sciences	Economics 120, 121—Principles of Economics I, II, 8 hours
	Behavioral sciences—anthropology or psychology or sociology, 8 hours
	History and/or political science, 8 hours
Humanities	15 hours, including 3 hours in fine arts—music or the history of art or the history of architecture
Natural Science	12 hours
Mathematics	110, 111, 112 Finite Mathematics and Introduction to Analysis I, II, or the equivalent, 11 hours
Electives	Electives outside the College to bring the total general education hours to 93. Exact elective hours are reduced wherever the student has earned more than the minimum hours shown for any area above.

Business Core Requirements

Management	350—Organization and Administration, 4 hours
	351—Organization Theory, 4 hours
	359—Business Policy, 4 hours
Accounting	100, 101, 102—Accounting, 9 hours
Quantitative Methods	270, 271, 272—Statistics, 12 hours
Economics	320—Macroeconomic Theory, 4 hours
	321—Microeconomic Theory, 4 hours
	322—Managerial Economics, or 323, Business Conditions Analysis, 4 hours
Finance	340—Money and Banking, 4 hours
	341—Business Finance, 4 hours
Marketing	360—Principles of Marketing, 4 hours
Business Law	310—Managerial Jurisprudence, 4 hours

Area of Specialization and Electives Approved by the Department

	32 hours required or approved by the major department

Summary of distribution of credit hours:

General Education Course Requirements	93
Business Core Course Requirements	61
Area of Specialization and Electives	32
Total hours required for graduation	186

A Typical Program in the College of Business Administration Common to All Areas Except Quantitative Methods

	Freshman Requirements	
English Composition 101	English Composition 102	Behavioral science
Mathematics 110	Mathematics 111[1]	Mathematics 112[1]
Economics 120	Economics 121	Behavioral science
Humanities[2]	Humanities[2]	Humanities[2]
	Sophomore Requirements	
Accounting 100	Accounting 101	Accounting 102
Quantitative Methods 270	Quantitative Methods 271	Quantitative Methods 272
Science (laboratory)[2]	Science (laboratory)[2]	Science (laboratory)[2]
Political science or history	Political science or history	Fine arts
	Junior Requirements	
Management 350	Economics 321	Economics 322 or
Marketing 360	Finance 341	Economics 323
Economics 320	Management 351	Major course[3]
Finance 340	Major course[3]	General education elective
		Business Law 310
	Senior Requirements	
Major course[3]	Major course[3]	Major course[3]
Major course[3]	Major course[3]	Major course[3]
General education elective	General education elective	Management 359
General education elective	General education elective	General education elective

1. Students with an interest in areas requiring a strong mathematics background should substitute Mathematics 130 and 131 for Mathematics 111 and 112.

2. Also included are those courses listed in this catalog under the College of Liberal Arts and Sciences entitled "Courses that Meet the Course-Distribution Requirements" *except* Mathematics 115-117.

3. A major course is one that is required or *approved* by the student's major department.

Curriculum Notes

Mathematics—All entering students, except those with transfer credit in college algebra, must take the Mathematics Placement Test. The student's score on the test will determine whether he is to enroll in Mathematics 100, 104, or the regular mathematics sequence[1]. Placement in Mathematics 100 requires completion of Mathematics 100 and 101 since 101 is a prerequisite for the regular mathematics sequence[1]. If the student's test score indicates enrollment in Mathematics 104, the course must be satisfactorily completed as a prerequisite to the regular mathematics sequence. Students who feel that

[1]The regular mathematics sequence 110, 111, 112 (or Mathematics 110, 130, 131) may begin with either 110 or 111 or 130 as 110 is not a prerequisite for 111 or 130.

their mathematics background is inadequate at the high school level should investigate the Mathematics 170, 171, 172 sequence. *Mathematics 100, 101, 104, 105, 106, 107, 108, 115, 116, 117, 170, 171, and 172 do not carry credit toward graduation.* The regular mathematics sequence must be completed as early as possible since many sophomore and junior courses require knowledge of their content. Placement in Mathematics 110 indicates that the student is prepared to begin the regular mathematics sequence.

If the student is required to take Mathematics 100 and 101 or Mathematics 104 or chooses to take the Mathematics 170, 171, 172 sequence, he may not be able to complete graduation requirements in 12 quarters and should plan for one or more additional quarters.

Students who plan to major in quantitative methods should consult with the Quantitative Methods Department if they have already completed Mathematics 111 and/or 112 to determine which courses should be taken to complete their mathematics background. Quantitative methods majors who have not yet completed Mathematics 111 or 112 should substitute Mathematics 130 and 131 for these courses and should consult the Quantitative Methods Department in planning their curricula. Students with an interest in areas requiring a strong mathematics background should also choose Mathematics 130 and 131 instead of Mathematics 111 and 112.

General Education Electives must be taken outside the College of Business Administration.

Business Core—All students in the College are required to take a common core of business courses that provide basic knowledge about the different areas of business that the student must have, regardless of his major.

Advisement and Course Selection

Students advance enroll for each quarter, usually during the fourth, fifth, or sixth week of the preceding quarter. Notification is made by mail of the date of advance enrollment. Two steps must be completed:

1. Advisement and course selection.
2. Completion of registration forms.

Student programs do not require approval by a faculty adviser. The student should consult this catalog and the Timetable for guidance in program planning. Special note should be taken of the course descriptions, prerequisites, and other restrictions listed in the Timetable, and of the requirements listed below. The student is urged to seek advice from the Office of the Associate Dean, 2430 University Hall, (or from an adviser in his major department) whenever he is in doubt about his course selections. The Office of the Assistant Dean will announce the time of advisement meetings during the quarter for those students who have not declared a major and wish to attend. After a student has declared a major he is assigned a faculty adviser

in his major department. Advisement procedures for students who have declared a major will be announced by their respective departments. Students who wish clarification of the information in this catalog or have questions about their records should consult the Examiner's Office, 2423 University Hall.

The responsibility for course selection rests with the student. Satisfactory progress toward the degree is defined as progressive fulfillment of all the requirements listed below:

A. All students must carry not less than 12 and not more than 19 hours each quarter. This applies to students on probation and to those in good standing.
B. Every student must enroll in mathematics *every quarter,* beginning with his first quarter at Chicago Circle, until the Mathematics 110, 111, 112 sequence or its equivalent is completed.
C. All sophomores *must* enroll in (1) Economics 120 or 121 and (2) Accounting 100 or 101 or 102 until these sequences are completed. These courses must be completed *before* the junior year.
D. Students must enroll in Quantitative Methods 270, 271, 272 as soon as prerequisites have been completed, preferably in their sophomore year. These courses should be completed before the senior year.
E. English Composition 101 and 102 must be completed before the sophomore year.
F. Transfer students must fulfill freshman and sophomore requirements as quickly as possible and must fulfill all the foregoing requirements.
G. Students who enroll in the summer quarter as their fourth quarter for that academic year may enroll, if they choose, for less than 12 quarter hours *for that quarter only.* If the student was granted an off-quarter vacation, *all* the foregoing requirements apply in the summer quarter.

If the student fails to show reasonable progress toward the degree, as defined above, his registration in the College of Business Administration may be cancelled.

Program Changes

Program changes after registration should be initiated in the office of the department offering the course. After registration, the completed program change forms should be returned to the Office of the Associate Dean, 2430 University Hall. The following information pertains to adding and dropping courses:

A. In the first two weeks of the quarter, a student may add or drop courses as he wishes.
B. After the second week, the student must obtain the written permission of the instructor or department on the program change form and return the form to 2430 University Hall.
C. A student who adds or drops a course in violation of rules of the College or University incurs the risk of having his registration cancelled, as does the student who fails to register properly.

D. A student must not drop all courses without officially withdrawing from the University. If he does so, his registration for the next term in which he is enrolled will be cancelled.

Academic Honors and Scholarships

The Dean's List

Students who have completed a minimum of 12 academic credit hours during a given quarter and have earned a grade-point average of at least 4.000 for that quarter (excluding grades in physical education, in basic military science, and in noncredit courses) are placed on the Dean's List for that quarter.

College Honors

To qualify for College Honors the student must:

1. Meet the College and University requirements for graduation.
2. Have carried at least 12 hours of academic work each quarter, exclusive of basic military training and and formerly required physical education.
3. Have attained at least a 4.000 average in all courses or a 4.500 average during the final two years (not less than 72 quarter hours) of courses completed at the University of Illinois and counted toward graduation by the College.

Note:

1. The work of the final quarter is not computed in this average.
2. The computations exclude transfer credit received during the last 72 hours.

Departmental Honors

Departmental honors may be awarded if the student meets the criteria established by the department in which he completes his major and by the College. His diploma will carry the designation "Distinction," "High Distinction," or "Highest Distinction." The criteria for departmental honors follow:

Accounting

1. Distinction: 4.000 overall and 4.100 in Accounting.
2. High Distinction: 4.500 overall *or* 4.400 overall and 4.700 in Accounting.
3. Highest Distinction: 4.750 overall *or* 4.600 overall and 4.900 in Accounting.

Economics

1. Distinction: Overall average of 4.000 to 4.499.
2. High Distinction: 4.500 to 4.749.
3. Highest Distinction: 4.750 and above.

Finance

1. Distinction: Overall average of 4.000 to 4.499.
2. High Distinction: 4.500 to 4.749.
3. Highest Distinction: 4.750 and above.

Management

1. Distinction: 4.000 overall to 4.499.
2. High Distinction: 4.500 overall to 4.699.
3. Highest Distinction: 4.700 overall and above.

Marketing

1. Distinction: 4.000 overall and 4.100 in Marketing.
2. High Distinction: 4.500 overall and 4.600 in Marketing.
3. Highest Distinction: 4.750 overall and 4.900 in Marketing.

Quantitative Methods

1. Distinction not given in Quantitative Methods.
2. High Distinction: 4.400 to 4.690.
3. Highest Distinction: 4.700 and above.

Scholarships, Financial Aid, and Special Awards

The College of Business Administration has been awarded scholarship money for students in several areas of concentration. See page 23 for scholarships available to students in the College of Business Administration.

Students in the College of Business Administration are also eligible to apply for other financial assistance. Information on other scholarships and financial aid can be obtained from the Office of Financial Aid, Room 809 University Hall.

Additional Rules of the College

Declaration of Major

A student should declare his major during the third or fourth week of his fifth quarter or its equivalent (75 quarter hours) so that he may be assigned a faculty adviser in his major department. The College offers six majors: accounting, economics, finance, management, marketing, and quantitative methods. The specific requirements for each major follow.

In the quarters following that in which the student declars his major, he must fulfill the requirements of the major that he has chosen.

Probation and Drop Rules

Probation and drop decisions are made on the basis of University of Illinois at Chicago Circle averages. Transfer averages are not used in determining probation and drop decisions except to determine if an entering student is to be placed on probation.

Probation Rules

1. A student in good standing is placed on probation in any quarter in which he earns less than a 3.000 average. A student entering his senior year is placed on probation if his college graduation average is below 3.000*.
2. A student is continued on probation (unless he is dropped) until he raises his cumulative Chicago Circle average to a 3.000. A student may not remain on probation for more than two consecutive quarters in which he is enrolled.

Drop Rules

1. Except for freshmen, a student on probation who fails to earn a 3.000 average in any quarter may be dropped.
2. A student who fails to earn at least a 2.000 average in any quarter may be dropped.
3. A student who does not achieve a Chicago Circle cumulative average of at least 3.000 after two quarters on probation may be dropped.

*The College graduation average is computed from those courses taken at Chicago Circle that are counted toward the student's degree and all transfer courses that meet degree requirements.

Petition Procedure

Any rule, regulation, or action of the College may be appealed through the use of the student petition. These petitions are ruled on by the Faculty Petitions Committee and often require the prior action of one of the departments of the University. The student is responsible for obtaining that action on the petition form. Petitions are available in the Office of the Associate Dean, 2430 University Hall. After being completed the petition must be returned to that office for action.

The Departments

Accounting

Professors: Edwin Cohen, Ph.D., C.P.A., Head of the Department; Samuel Fox, J.D., Ph.D., C.P.A.; Alfonse T. Malinosky, M.B.A., C.P.A.; Albert J. Schneider, M.B.A., C.P.A.

Associate Professors: James R. Adler, Ph.D., C.P.A.; S. Madonna Kabbes, M.B.A., C.P.A. (Emerita).

Assistant Professors: Chiou-hsiung Chang, M.B.A.; Josephine A. Margraff, M.B.A.; LeRoy J. Pryor, D.B.A., C.P.A.; Wagdy K. Sharkas, Ph.D.

Instructors: Neal H. Gottlieb, M.A.S., C.P.A.; Paul R. O'Brien, M.B.A., C.P.A.; Larry M. Zanger, J.D., C.P.A.

Lecturers: Leslie J. Burton, M.S.; Stanford J. Cole, M.B.A., C.P.A.; James E. Moore, M.S., C.P.A.; Richard L. Weiss, J.D., C.P.A.

Accounting is concerned with (1) the measurement of income and wealth derived from economic enterprise and (2) the communication of information about the financial condition of and the results of activities of economic organizations. The specific functions include management control, tax management, and the attest function.

Required Courses—32 hours, distributed as follows:

Accounting 301—Asset Valuation and Income Determination, 4 hours
Accounting 302—Accounting for Entity Interest, 4 hours
Accounting 300—Managerial Cost Accounting, 4 hours
Accounting 303—Auditing, 4 hours
Accounting 304—Federal Income Tax, 4 hours

Restricted Elective—8 hours from the following:
Accounting 305—Planning and Control, 4 hours
Accounting 306—Readings and Advanced Problems, 4 hours
Accounting 307—Federal Income Tax-Advanced, 4 hours
Quantitative Methods 375—Information Systems I, 4 hours
Quantitative Methods 376—Information Systems II, 4 hours
Quantitative Methods 370—Multivariate Analysis, 4 hours
Mathematics 194—Introduction to Automatic Digital Computing, 4 hours
Economics 335—Econometrics, 4 hours

Electives approved by the department, 4 hours

Suggested Course Schedule for Accounting Majors

Junior Year

First Quarter	*Hours*
Accounting 301	4
Economics 320	4
Marketing 360	4
Management 350	4
	16

Second Quarter	
Accounting 302	4
Economics 321	4
Finance 341	4
Management 351	4
	16

Third Quarter	
Accounting 300	4
Economics 322 or 323	4
Behavioral science or history or political science	4
Fine arts	3
General education elective or accounting elective	3
	18

Senior Year

First Quarter	*Hours*
Accounting 303	4
Behavioral science or history or political science	4
General education elective	5
Humanities	4
	17

Second Quarter	
Accounting 304	4
Business Law 310	4
Accounting or business elective	4
Humanities	4
	16

Third Quarter	
Accounting elective	4
Management 359	4
General education elective	4
Humanities	4
	16

Economics

Professors: George Rosen, Ph.D., Head of the Department; William Grampp, Ph.D.; Richard F. Kosobud, Ph.D., Oscar Miller, M.A.

Associate Professors: Eliezer B. Ayal, Ph.D.; Bert Elwert, Ph.D.; Allen Sinai, Ph.D.

Assistant Professors: Robert D. Auerbach, Ph.D.; Donald E. Baer, Ph.D.; H. Woods Bowman, Ph.D.; Anna Craig, Ph.D.; Frances V. Flanagan, Ph.D.; Winifred B. Geldard, M.B.A., C.P.A. (Emerita); Kurt F. Hausafus, Ph.D.; Mildred Levy, Ph.D.; John F. McDonald, Ph.D.; Ronald P. Moses, Ph.D.; Sol Shalit, Ph.D.; Houston H. Stokes, Ph.D.; Patricia D. Trainer, Ph.D. (Visiting).

Instructors: Michael S. McPherson, M.A.; Norman S. Smith, B.S.

Lecturers: Richard Barichello, A.M.; Gary Eriksen, M.A.; Michael Halberstadt, M.A.; Muhammad Ul-Abrar Hasan, M.A.; Janice M. Jacobson, LL.D.; Stanley Nollen, M.B.A.; Aleta D. Styers, M.A.; Charles Weber, M.A.

Economics deals with determinants of the general level of employment, production, and income and the principles of allocating resources to maximize benefits to the public. It provides the essential background for applications in business administration and the social sciences.

Required Courses—32 hours, distributed as follows:

A. Four courses in the Department of Economics in addition to courses counted in the business core. These courses must be at the 300 level or above and must total at least 16 credit hours.

B. The remaining 16 hours may be taken in any other courses in the College of Business Administration or in courses acceptable for the degree in other colleges (except courses in military science and physical education). Courses taken at other institutions may be used if transfer credit is granted by the College of Business Administration.

Suggested Course Schedule for Economics Majors

Junior Year

First Quarter	*Hours*
Economics 320	4
Management 350	4
Marketing 360	4
Behavioral science or history or political science	4
	16

Second Quarter	
Economics 321	4
Finance 341	4
Management 351	4
Behavioral science or history or political science	4
	16

Third Quarter	
Economics 322 or 323	4
Fine arts	3
300-level economics course	4
General education elective	4
	15

Senior Year

First Quarter	*Hours*
Business Law 310	4
Humanities	4
General education elective	5
300-level economics course	4
	17

Second Quarter	
Humanities	4
General education elective	4
300-level economics course	4
Elective	4
	16

Third Quarter	
Management 359	4
Humanities	4
300-level economics course	4
Elective	4
	16

Finance

Professors: William W. Tongue, Ph.D., Head of the Department

Associate Professors: Fayette B. Shaw, Ph.D. (Emeritus).

Assistant Professors: Rolf K. Auster, Ph.D.; Suleman A. Moosa, Ph.D. (Visiting).

Instructors: Murray A. Goldberg, M.B.A.

Lecturers: William E. Byerts III, M.A.; George C. Catsiapis, M.S.; Mark I. Weinstein, M.S.

The finance curriculum explores the influence of the monetary and banking system on the general business level, the principles of financial analysis and control as applied to individual business firms, and economic and financial factors bearing on the valuation and selection of securities.

Required Courses—32 hours, distributed as follows:

Finance 342—Investments, 4 hours
Finance 343—Risk and Insurance, 4 hours
Finance 344—Investment Policy, 4 hours
Finance 345—Problems in Business Finance, 4 hours

Electives—16 hours:

1. Any 300-level course in the College of Business Administration not being used to satisfy business core requirements.
2. Other courses as approved by a member of the finance faculty.

Suggested Course Schedule for Finance Majors

Junior Year

First Quarter	*Hours*
Economics 320	4
General education elective	4
Management 350	4
Behavioral science or history or political science	4
	16

Second Quarter	
Economics 321	4
Marketing 360	4
Management 351	4
Behavioral science or history or political science	4
	16

Third Quarter	
Accounting 301	4
Finance 341	4
Fine arts	3
Finance 343	4
	15

Senior Year

First Quarter	*Hours*
Business Law	4
Humanities	4
Finance 342	4
General education elective	5
	17

Second Quarter	
Finance 344	4
Humanities	4
Finance 345	4
Economics 323*	4
	16

Third Quarter	
Management 359	4
Humanities	4
General education elective	4
Economics 322*	4
	16

*Recommended.

Management

Professors: S. George Huneryager, Ph.D., Head of the Department; Bernard H. Baum, Ph.D.; Raymond W. Coleman, Ph.D. (Emeritus); Irvin L. Heckmann, Ph.D.

Associate Professors: Hale C. Bartlett, Ph.D.; William J. Dunne, M.B.A.; Bert E. Elwert, Ph.D.; Ronald E. Jablonski, D.B.A.; Ronald L. Miller, Ph.D.

Assistant Professors: Andrew F. Sikula, Ph.D.; William M. Sukel, D.B.A.; Joseph A. Wolfe, Ph.D.; David B. Vellenga, M.B.A.; Maryann M. Albrecht, M.A.; John E. Ettlie, M.S.

Lecturers: Nicholas J. Mathys, M.B.A.; Patrick F. Rea, M.B.A.; Fred R. Travis, M.B.A.

The degree program in management provides students with a theoretical and practical preparation for assuming responsible managerial and executive positions in a variety of working organizations. All specialized options within the Department of Management emphasize analytical preparation for effective decision making and for broadening preparation for leadership positions.

Required Courses—32 hours, distributed as follows:
1. Management 352—Administrative Practices, 4 hours
2. Two courses from the following fields—8 hours:

Operations and Systems Management

This option provides the student with a sound background in the management sciences and in the production function common to all work organizations. Emphasis is upon computer applications, management information systems, and materials management.

For specialists in operations and systems management:
Management 355—Operations and Systems Management I, 4 hours.
Management 356—Operations and Systems Management II, 4 hours.

Personnel and Industrial Relations

Personnel and industrial relations is concerned with the effective utilization of human resources within work organizations. Emphasis is on the behavior of people at work and the staff programs available to managers for more effectively utilizing people at work and for coping with human problems. Union-management relations are also explored.

For specialists in personnel and industrial relations:
Management 353—Personnel Management, 4 hours
Management 354—Industrial Systems, 4 hours

General Administration

The emphasis of the general administration program is on acquainting students with the many and varied aspects of the manager's role in complex working organizations. Stress is placed upon the internal dynamics of complex work organizations, the structural components, and the many personal and interpersonal problems of the manager.

For general administration background students: a combination of the above options with the consent of the adviser.

3. Three courses from the following areas—12 hours:
   A. Management 360—Business, Society, and Technology, 4 hours
   B. One approved 300-level business course
   C. One approved 200-level or 300-level course outside of business
4. Electives approved by the department, 8 hours

Suggested Course Schedule for Management Majors

Junior Year

First Quarter	*Hours*
Economics 320	4
Management 350	4
Marketing 360	4
Behavioral science or history or political science	4
	16

Second Quarter	
Economics 321	4
Finance 341	4
Management 351	4
Behavioral science or history or political science	4
	16

Third Quarter	
Economics 322 or 323	4
Fine arts	3
Management 352	4
Major subject	4
	15

Senior Year

First Quarter	*Hours*
Business Law 310	4
Humanities	4
Major subject	8
	16

Second Quarter	
Humanities	4
General education elective	4
Major subject	8
	16

Third Quarter	
Management 359	4
Humanities	4
Major subject	8
	16

Marketing

Professors: Robert E. Weigand, Ph.D., Head of the Department; Carl M. Larson, M.B.A.

Associate Professors: Laurence P. Feldman, Ph.D.; Mary Jane Schlinger, Ph.D.; Alvin D. Star, Ph.D.

Assistant Professors: Gary M. Armstrong, Ph.D.; Jacob Hornik, Ph.D.

Lecturers: Roger J. Baran, M.B.A.; Eric S. Stein, M.B.A.

Marketing anticipates and defines the needs of prospective household and industrial consumers, plans products and services that meet those needs, and promotes and physically distributes them throughout the world under a variety of different circumstances.

The following courses are required of all marketing majors:
- Marketing 361—Consumer Market Behavior
- Marketing 362—Marketing Research
- Marketing 365—Marketing Management

At least 8 hours from among the following major-subject courses:
- Marketing 363—Marketing Organization
- Marketing 364—Managing Marketing Communications
- Marketing 366—Comparative Marketing Systems
- Marketing 390—Special Topics in Marketing

Electives totaling 12 hours of major-subject courses from the following:
1. Any marketing course not taken previously.
2. Any 300-level course offered by the Departments of Accounting, Economics, Management, Quantitative Methods, and Finance that is not required elsewhere in the curriculum.
3. Any 200-level or 300-level course offered by the Departments of Mathematics, Psychology, and Sociology that is not required elsewhere in the curriculum.
4. Any other course that is approved by the Department of Marketing.

Suggested Course Schedule for Marketing Majors

Junior Year

First Quarter	*Hours*
Marketing 360	4
Economics 320	4
Management 350	4
Behavioral science or history or political science	4
	16

Second Quarter	
Marketing 361	4
Economics 321	4
Management 351	4
Finance 341	4
	16

Third Quarter	
Marketing 362	4
Economics 322 or 323	4
Behavioral science or history or political science	4
Fine arts	3
	15

Senior Year

First Quarter	*Hours*
Business Law 310	4
Humanities	4
Marketing course	4
Marketing course or major subject elective	4
	16

Second Quarter	
Humanities	4
Marketing course	4
Marketing course or major subject elective	4
General education elective	5
	17

Third Quarter	
Humanities	4
Marketing 365	4
Management 359	4
Marketing course or major subject elective	4
	16

Quantitative Methods

Professors: Leonard Kent, Ph.D., Head of the Department; Lucile Derrick, Ph.D.; Brian Gluss, Ph.D.

Associate Professors: Edward T. Minieka, Ph.D.; Lalitha P. Sanathanan, Ph.D.

Assistant Professors: Kenneth J. Cypra, Ph.D. (Visiting); Donald N. Steinnes, Ph.D.; Walter J. Wadycki, Ph.D.

Instructors: James E. Hall, M.S.; Margaret K. Schaefer, M.A.

During the past few years there has been a rapid growth of a body of knowledge in which mathematics is applied to the analysis of business problems. These developments are based on techniques drawn from classical mathematics in areas such as matrix algebra, calculus, and probability theory. In addition, these developments have stimulated new types of mathematical analyses, such as linear programming, dynamic programming, theory of games, and other analytical techniques usually associated with operations research.

The Department of Quantitative Methods in the College of Business Administration requires of its majors a thorough background in classical mathematics and up-to-date knowledge in many of the aspects of operations research and computer science. These will enable graduates to bring to the business world an analytical approach to the solution of business problems; also, government and other areas of public administration find a use for specialists in this area. Graduates can expect to find employment in such fields as systems analysis, computer center operation, statistical quality control, and sampling.

Required Courses—32 hours, distributed as follows:
Quantitative Methods 370—Multivariate Analysis, 4 hours
Quantitative Methods 371—Survey Research, 4 hours
Quantitative Methods 375—Systems, 4 hours
Quantitative Methods 376—Survey of Operations Research, 4 hours
Mathematics 375—Probability II, 3 hours
Electives approved by the department, 13 hours.

Typical Program in Quantitative Methods

Freshman Year

First Quarter	*Hours*
Mathematics 110	5
English Composition 101	4
Humanities	4
History or political science	4
	17

Second Quarter	
Mathematics[1]	5
English Composition 102	4
Humanities	4
Behavioral science	4
	17

Third Quarter	
Mathematics[1]	5
Humanities	4
History or political science	4
Behavioral science	4
	17

Sophomore Year

First Quarter	*Hours*
Accounting 100	3
Economics 120	4
Quantitative Methods 270	4
Mathematics[1]	5
	16

Second Quarter	
Accounting 101	3
Economics 121	4
Quantitative Methods 271	4
Mathematics[1]	5
	16

Third Quarter	
Accounting 102	3
Quantitative Methods 272	4
Mathematics[1]	4
Elective[1]	4
	16

Junior Year

First Quarter	*Hours*
Finance 340	4
Economics 320	4
Management 350	4
Marketing 360	4
	16

Second Quarter	
Finance 341	4
Economics 321	4
Management 351	4
Fine arts	4
	16

Third Quarter	
Economics 323	4
Management 359	4
Business Law 310	4
Mathematics 195	3
	15

Senior Year

First Quarter	*Hours*
Quantitative Methods 369	4
Quantitative Methods 375	4
Elective[1]	4
	12

Second Quarter	
Quantitative Methods 370	4
Quantitative Methods 371	4
Elective[1]	4
	12

Third Quarter	
Quantitative Methods 376.	4
Electives[1]	8
	12

[1]With departmental approval

The following are suggested electives for quantitative methods majors:

1. Quantitative Methods 275—Data Processing Using COBOL
   Quantitative Methods 370—Dynamic Programming
   Economics 335—Econometrics

2. Mathematics 280—Problem Oriented Languages
   Mathematics 281—Assembly Language Programming

3. Mathematics 220—Elementary Differential Equations I
   Mathematics 321—Elementary Differential Equations II
   Mathematics 322—Elementary Partial Differential Equations I

4. Mathematics 310—Higher Analysis I
   Mathematics 311—Higher Analysis II
   Mathematics 312—Higher Analysis III

5. Mathematics 340—Modern Higher Algebra I
   Mathematics 341—Modern Higher Algebra II
   Mathematics 342—Modern Higher Algebra III

Any of the mathematics courses listed above may be used to satisfy the 12-hour natural sciences or mathematics requirement or the elective hours in general education. The economics and quantitative methods courses may be used as electives for the quantitative methods major.

The College of Education

Van Cleve Morris, Ed.D., Dean of the College
George C. Giles, Jr., Ph.D., Associate Dean
Geraldine D. Brownlee, M.S.T., Assistant Dean for Student Services
Emanuel Hurwitz, Jr., Ph.D., Assistant Dean for Administration
David A. Wilson, M.S., Assistant Dean for Business Affairs
Joseph J. Malinchoc, Ed.D., Director of Secondary Student Teaching
Dolores I. Taylor, Ed.M., Director of Elementary Student Teaching

Professors: Jean H. Baer, Ph.D.; Maurice J. Eash, Ed.D.; Thomas E. Linton, Ph.D.; Van Cleve Morris, Ed.D.; Helmer Myklebust, Ed.D.; David A. Page, A.M.; Victor E. Ricks, Ph.D.; Robert Rippey, Ph.D.; Herbert J. Walberg, Ph.D.

Associate Professors: Armin Beck, Ph.D.; Patricia Charlier, Ph.D.; George C. Giles, Jr., Ph.D.; Emanuel Hurwitz, Jr., Ph.D.; Eliezer Krumbein, Ph.D.; Joseph J. Malinchoc, Ed.D.; Julius Menacker, Ed.D.; George Monroe, Ph.D.; Elizabeth C. Porch, Ed.D.; Daniel Powell, M.A.; William Price, Ed.D.; Robert Ratcliffe, Ed.D.; Madelaine T. Shalabi, Ph.D.; Harriet Talmage, Ph.D.; Charles A. Tesconi, Jr., Ed.D.; Philip W. Tiemann, Ph.D.; Judith V. Torney, Ph.D.; Edward Wynne, Ed.D.

Assistant Professors: Robert R. Blake, Ph.D.; Joseph L. Braga, Ed.D.; Geraldine D. Brownlee, M.S.T.; Tanis Bryan, Ph.D.; Carmen J. Carsello, Ph.D.; Rheta DeVries, Ph.D.; Patricia Engle, Ph.D.; Wayne Fredrick, Ph.D.; James Griggs, M.Ed.; Anne Heinz, Ph.D.; Helen E. Hughes, Ph.D.; Marie Johnson, Ph.D.; James R. Killen, Ed.D.; Charles E. Mader, Ed.D.; Jean Oak, Ed.D. (Visiting); Susanna Pflaum, Ph.D.; Leyhmann Robinson, Ed.D.; Aimee Strawn, M.Ed.; Roland Swaim, Ed.D.; Donald R. Warren, Ph.D.; Ward Weldon, Ph.D.; Stephen H. Wilson, Ph.D.

Instructors: Ann Aldrich, B.S.; Faizunisa A. Ali, M.A.; L. Thurston Barnett, M.A.; William Duke, M.Ed.; Warren Franczyk, M.Ed.; Gloria Gibbs, M.A., M.Ed.; Frances Goldenberg, M.A.; Grace Hopkins, M.Ed.; Anna Larson, M.Ed.; Susan Levy, M.S.; John Long, B.A.; Sheila McKenzie, B.Mus.; Ramon Merlos, M.A.; Henrietta Miller, M.A.; Ruth Nedelsky, M.A.; Tomas Rabell-Ramos, M.A.; Margaret A. Richek, M.A.; Andrew Robinson, M.A.; Dolores I. Taylor, M.Ed.; David A. Wilson, M.S.; Annette Yonke, M.A., M.Ed.

Lecturers: Bailey Bishop, B.S.; Muriel Moulton, M.A.; Bernard Salzberg, Ph.D.; Frank Vaccaro, M.F.A. (Visiting).

Assistants: Mark Bargen; Larry T. Byrd, B.A.; Adalton C. Caram, B.A.; Paul A. Jarvis, M.A.; Lawrence G. Koranda, B.A.; Virginia Kramer, M.A.; Roger P. Larsen, B.S.; Sylvia Silvero, B.A.; Sheryl Steinberg, B.A.; Cheryl Tabatabai, B.A.

Special Programs: Anne Marr, Leon Mattigosh, Juan Morales, Patricia Wesaw, Donald White.

Student Teaching Supervisors

Secondary School. *Anthropology:* Charles P. Warren, M.A.; *Art:* Leon Bellin, M.A., Suzanne Cohan, M.A.E., Laura Kiviat, M.F.A.; *Biology:* Elmer B. Hadley, Ph.D.; *Chemistry:* Frances K. Seabright, M.S.; *Earth Sciences:* Norman D. Smith, Ph.D.; *English:* Maureen A. Fay, M.A., Louise A. Glickman, M.A., Amy Lindley, A.M.T., Daniel Lindley, Ph.D., Joan P. Reiter, M.A., Ellen Van Laningham, M.A.; *French:* Dorothy G. Barber, M.A.; *Geography:* Mildred I. Finney, Ph.D.; *German:* Arnold J. Hartoch, Ph.D., David M. Weible, M.A.; *History:* Gerald A. Danzer, Ph.D., Nazaris A. Devine, B.A., Muriel Moulton, M.A., Muriel B. Stone, B.M.E.; *Mathematics:* Winifred Berglund, M.A., William B. Duffie, M.A., Julia B. Linn, M.S., Kenneth H. Murphy, M.S., Grace M. Nolan, M.A., Helen W. Sears, M.A., Rose L. Vedral M.A.; *Physical Education for Men:* Benedict W. Montcalm, M.A., James A. Nasiopulos, B.S.; *Physical Education for Women:* Helen M. Heitmann, D.P.E., Anne K. Klinger, M.A., Marian E. Kneer, Ph.D., Anna M. Neumann, B.S., Nina K. Pappas, M.A.; *Physics:* Edward B. McNeil, Ph.D.; *Slavic Languages:* Wilma Hoffman, M.A.; *Sociology:* Philip R. Weinberger, M.A.; *Spanish:* Violet E. Bergquist, M.A., Shirley A. Verdugo-Perez, M.A.; *Speech:* Judith O'Malley, M.A., Royce Rodnick, M.A.

Elementary School. Bailey Bishop, B.S.; William Duke, M.Ed.; Warren R. Franczyk, M.A.; Frances H. Goldenberg, M.A.; Andrew Robinson, M.A.

Special Education. Ann Aldrich, B.S.; Tanis H. Bryan, Ph.D.; Grace Hopkins, M.Ed.; James R. Killen, Ed.D.; Thomas E. Linton, Ph.D.; Helmer R. Myklebust, Ed.D.; Suzanne M. Perlman, Ph.D.

Established to provide professional study in education, the College offers the professional courses for students preparing to teach in the elementary and secondary schools, with unique opportunities for students who plan to teach in urban schools. Courses in general education and in the areas of specialization for students preparing to teach in secondary schools are administered by and taught in the various departments of the colleges. Students preparing to teach physical education enter the School of Physical Education, and those preparing to teach in the secondary schools enter the College of Liberal Arts and Sciences or the College of Architecture and Art. See *Requirements for Admission to Undergraduate Study.* The curricula for the preparation of elementary, special education, and secondary school teachers as listed in this catalog have been approved by the University, the Illinois State Certification Board, and the National Council for the Accreditation of Teacher Education.

Emphasis on Urban Education

Located as it is in the center of a great metropolis, the College is ideally situated to educate teachers for urban schools. Cooperative programs with the

Chicago Public Schools and nearby suburban schools afford excellent opportunities for useful laboratory experiences and research. The College supports appropriate community projects and welcomes community cooperation for improvement of teacher education.

Special and Experimental Programs

The College of Education offers these special and experimental programs:

Bilingual Teacher Training Program—Designed to educate University of Illinois Puerto Rican and other students of Spanish background as elementary school teachers, this program works in cooperation with ASPIRA, Inc. of Illinois, a federally funded community project. The Bilingual Teacher Training Program, with its important community component, is a prototype of innovative procedures for aiding urban schools with large Latin populations.

Special Education Program—The College of Education offers programs that prepare teachers of emotionally disturbed children, children with learning disabilities, and mentally retarded children. These three sequences of courses comprise the College of Education Program in Special Education. Enrollment in this program leads to a B.A. and eligibility to apply for State certification, City of Chicago certification for teaching in the elementary grades, and for certification as a teacher of exceptional children. Students apply for admission in the Special Education Program at the beginning of their sophomore year and pursue studies in special education in their junior and senior years. Information may be obtained in the College of Education office. Selection of students for the program is made by the Special Education Program faculty.

Cooperative Teacher Corps Project—The College of Education, in conjunction with the Chicago Public Schools and the Latin-American community of District 19, offers a two-year teacher education program to prepare bilingual and bicultural candidates to teach in urban schools that enroll predominantly Latin-American, and especially Mexican-American, students. During 1972-1974, the Chicago Board of Education, through the superintendent of District 19, will bring into this program a portal school, parents and educators committed to support of individualized instruction, a bilingual and bicultural curriculum, and differentiated staffing of school personnel.

Students who are interested in enrolling in the Cooperative Teacher Corps Project should have completed a minimum of 90 quarter hours (junior standing). Entry into the program is contingent, also, on approval by a selection panel consisting of College, school system, and community members.

The Office of Evaluation Research

Established in 1969 in answer to the increasing demand for evaluation assistance in university, government, and school-related programs, the office is concerned with both theoretical and applied approaches to evaluation. The research staff is mainly involved with projects that operate in urban settings.

The Council on Teacher Education

The University Council on Teacher Education is responsible for coordinating teacher education programs throughout the University and for maintaining relationships with the Chicago and the State of Illinois certification authorities. On recommendation by the University to the State Teachers Certification Board, graduates of teacher education curricula are eligible for certification in Illinois outside of Chicago. Graduates generally qualify for certification in other states and are generally eligible to take the examination for Chicago also. To be eligible for graduation and recommendation for certification a student must be enrolled in an approved program in teacher education. Graduates of curricula approved by the Council on Teacher Education are eligible for admission to the graduate college of most institutions that offer majors in the student's first or second field of specialization or in the professional areas of education.

The student who does not intend to complete the approved program in teacher education at Chicago Circle but is interested in fulfilling minimum academic requirements for State of Illinois certification should contact the State Teacher Certification Board, 188 W. Randolph Street, Chicago, Illinois 60601; telephone, 793-2230. He should ask for information sheets titled "Instructions for Applying for Illinois Certification."

Applicants for a temporary certificate to teach in the Chicago Public Schools should contact the Board of Examiners, Room 1026, 228 North LaSalle Street, Chicago, Illinois 60601; telephone, 641-4141. Information regarding certification in the Chicago Public Schools is contained in their publication "Circular of Information."

Admission Requirements

An applicant for admission to a teacher education curriculum must meet the admission requirements of the college or department offering the chosen curriculum. A student who transfers to a teacher education curriculum of the University of Illinois at Chicago Circle from another program, college, or institution and who has completed 90 quarter hours of credit must present a grade-point average of at least 3.500 (based on a 5.000 system) for admission in good standing. During the 1970 academic year an experimental program was initiated for the admission of a limited number of upper-level students who do not meet minimum entrance requirements. Information about this program is available from the Assistant Dean for Student Services of the College of Education.

Advising Program

Each student will be assigned an adviser in his first field of specialization; for example, if he plans to teach English, he will have an adviser in the English Department who will guide him in his selection of courses preparatory to the teaching of English and to eligibility for certification. Elementary education students will be advised by the faculty and staff of the Office of Student Services of the College of Education.

Students who desire to enter a teaching curriculum or desire to change from one teacher education curriculum to another should consult with the dean or director of the college in which the curriculum is administered.

Advanced-Standing Requirements

Continuation in teacher education curricula beyond the sophomore year is contingent on admission to advanced standing in teacher education, determined after the completion of 75 to 90 quarter hours of course work. The decision is based on the applicant's academic and personal qualifications.

Student Teaching

Admission to Elementary Student Teaching

A professional quarter of student teaching (including a weekly seminar) is required in the senior year of the elementary education program after the student has earned 135 or more quarter hours. The following courses, including practicums, must be completed to be eligible for student teaching:

Art 204
Education 170, 201, 210, 221, 235, 236, 237, 261
Health Science 180
Mathematics 106, 107, 108
Music 249, 250
Physical Education for Women 280
Speech 171

To qualify for student teaching, the student must have senior standing, a grade-point average no lower than 3.500 for all course work, and the approval of a College of Education screening committee.

An application for student teaching must be made no later than the winter quarter preceding the academic year in which a student-teaching assignment is desired. Students are informed of application procedures during the fall and winter quarters through notices read in all education courses. Students may also obtain information and required forms from the Office of the Coordinator of Elementary School Student Teaching, Room 3335, Education and Communications Building. The prospective student teacher is responsible for updating the information contained in his Application for Student Teaching. This should be done each quarter after submitting the application.

Only those enrolled students who complete the professional sequence of the College of Education are eligible for participation in the elementary school student-teaching program that operates during the fall, winter, and spring quarters. A candidate for a degree in elementary education must satisfactorily complete student teaching.

The coordinator of elementary school student teaching will make assignments to be carried out on a full-time basis in selected public and nonpublic schools in Chicago and the suburbs.

Curriculum Preparatory to Teaching in Elementary Schools

For the Bachelor of Arts in Elementary Education, a minimum of 180 quarter hours (excluding formerly required physical education) are required, distributed as follows:

Language Arts — 12 hours

English Composition 101, 102 (8 hours)
Speech 171—Principles of Speech Development and Correction (4 hours)

Humanities Electives — 8

English or foreign-language literature or humanities

Social Science — 20

American History (4 hours), Political Science 151 (4 hours), and Psychology 100, 101 (8 hours) are required. The remaining 4 hours must be taken in the social science area in cultural anthropology, geography (except courses in physical geography) history, political science, psychology, or sociology.

Natural Science and Mathematics — 20

A student may select any combination of courses, for a total of 20 hours, that he is eligible to take in:

Biological Sciences	Mathematics[1]
Chemistry	Natural Science
Physical Geography	Physics

[1]Mathematics 100, 101, 104, 105, 106, 107, 108, 115, 116, 117 do not fulfill this requirement. Mathematics 170, 171, 172 credit is allowed only for Educational Assistance Program students.

Mathematics — 12

Mathematics 106, 107, 108—Mathematics for Elementary Teachers

Physical Education — 4

Physical Education for Women 280—Elementary School Physical Education Activities

Art — 4

Art 204—Art for Elementary Teachers: Studies in Creativity

Music	
Music 249—Music Skills and Rudiments[2]	8
Music 250—Music Skills and Rudiments	4
Education	47
Education 170—Educational Foundations	4
Education 201—Fundamentals of Health Education	3
Education 210—The Educative Process	4
Education 221—Children's Literature	4
Education 235—Curriculum, Instruction, and Evaluation I	4
Education 236—Curriculum, Instruction, and Evaluation II	4
Education 237—Curriculum, Instruction, and Evaluation III	4
Education 261—Fundamentals of Reading Instruction	4
Education 270—Educational Practice with Seminar I	8
Education 271—Educational Practice with Seminar II	8
Areas of Concentration	12
At least 12 hours of courses in an area of concentration, exclusive of required courses. The adviser must approve the area of concentration.	
General Electives	33
	180

[2]A proficiency examination in Music 249 (prerequisite for Music 250) is given by the Department of Music in the fourth week of each quarter. Arrangements for this test are made with the department office.

Admission to Secondary School Student Teaching

A candidate for certification in secondary school education must complete Education 170, 210, 230 (or an alternative course in secondary school curriculum and instruction), and 250 preparatory to student teaching. In addition, he must fulfill the requirements of the college or department in which he is enrolled. It is recommended that student teaching be completed during the next-to-last quarter of the student's program; however, if the next to the last quarter is the summer quarter, student teaching is completed during the final quarter.

Application for secondary school student teaching must be made during the winter quarter of the academic year preceding the student teaching experience. Orientation meetings organized by the director of secondary school student teaching are held early in the winter quarter to clarify application and other procedures. The time and place of orientation meetings are announced during the fall and winter quarters.

Full-time student teaching assignments to appropriate secondary schools in Chicago and the suburbs are made for those students who have been admitted to advanced standing in teacher education and who have also met the requirements of the individual departments. During the student-teaching quarter the student attends a weekly seminar held on campus.

Curricula Preparatory to Teaching in Secondary Schools

The student who seeks a degree and certification for teaching at the secondary level may have *two* teaching specializations. The curricula in teacher education provide for the development of the major field of specialization; the minor specialization, if required for the degree, should be selected from the following list of major fields of specialization. See also page 138 for teacher education curricula.

Fields of Specialization

The total hours required are exclusive of those in basic military science and formerly required physical education.

Field	*Degree*	*General Education*	*Major*	*Minor*	*Education*	*Electives*	*Total Hours*
Art[1]	B.A.	58	60	—	32	—	195
Biology	B.S.	40-52	48	33	32	0-14	195
Chemistry	B.S.	32-56	53	34-42	32	0-29	180
Earth Sciences	B.A.	32-64	46-52	39-40	32	0-31	180
English	B.A.	52-76	48	32	32	0-18	180
French	B.A.	54	54	20	32	25-31	180
Geography	B.S.	40-64	48	36	32	10-34	180
German	B.A.	40	48	—	32	60	180
History	B.A.	48-72	48	—	32	28-52	180
Mathematics	B.S.	52-76	57	30	32	5-19	180
Physical Education[2]	B.S.	50	75-77	—	28	31-41	186-194
Physics	B.S.	37	47	31	32	2-22	180
Russian	B.A.	52	48-72	32	32	28	184
Sociology	B.A.	52-76	48	—	32	0-22	180
Spanish	B.A.	52	49	30	32	28-34	180
Speech	B.A.	52-76	48	30	32	0-22	180

[1] Total hours include 45 in the foundation program. The field of specialization in art is administered by the Department of Art. See page 87.

[2] Physical education is administered by the School of Physical Education. See page 188.

The College of Engineering

George Bugliarello, Sc.D., Dean of the College
Herbert J. Stein, Ph.D., Associate Dean
William DeFotis, M.S., Assistant Dean
Henry A. Setton, M.I.E., Assistant Dean
H. Dale Walraven, M.A., Assistant Dean

The College of Engineering prepares young men and women for one or more of the many career opportunities in the engineering profession, such as those in design, production, research, development, management, and construction. An engineering education also prepares a student for work in medicine, law, public administration, and other areas.

Instruction in the College is complemented by intensive research activity by most of the faculty. Research is directed toward supporting the educational programs of the College, solving contemporary technological problems, and extending the frontiers of scientific knowledge. This continuing research activity helps to insure the integrity and progressive evolution of instructional programs at all levels. In conjunction with their teaching and research, many of the faculty also engage in public service activities in the community and in government on the local, state and federal levels.

The Departments of the College of Engineering

The administrative structure of the College is organized according to the basic, functional engineering areas of *energy, information, materials,* and *systems.* The faculty are grouped in departments corresponding to these areas and in a program in *bioengineering.* Within this framework many instructional and research activities are cross-departmental, and the faculty in each department may cover several disciplines. This functional arrangement broadens the educational scope of the College and encourages interdisciplinary and innovative programs. The faculty are presently engaged in teaching and research activities pertinent to almost all fields of the engineering profession.

The Faculty of the College of Engineering

The Department of Energy Engineering

Professors: James P. Hartnett, Ph.D.; Head of the Department; Paul M. Chung, Ph.D.; John H. Kiefer, Ph.D.; Satish C. Saxena, Ph.D.; Harold A. Simon, Ph.D.

Associate Professors: Lyndon R. Babcock, Ph.D.; Joseph C.F. Chow, Ph.D.; Allen C. Cogley, Ph.D.; David S. Hacker, Ph.D.; Wolodymyr J. Minkowycz, Ph.D.; Edward S Pierson, Sc.D., Associate Head of the Department; Stephen Szepe, Ph.D.

Assistant Professors: John C. Cutting, Ph.D.; G. Ali Mansoori, Ph.D.; Edward J. Schlossmacher, Ph.D.; Kenneth L. Uherka, Ph.D.; Calvin J. Wolf, Ph.D.

Assistants: Robert J. Allen, B.S.; Robert C. Brandys, B.S.; Ronald J. Bywater, M.S.; Ki Chang, M.S.; Samuel H.P. Chen, M.S.; Henry Domanus, M.S.; Alfonso Fosco, B.S.; Barry L. Gilbert, M.S.; Zuu-Chang Hong, M.S.; Choong Se Kim, B.S.; Pericles Koronakis, M.S.; Shing-Shong Lan, M.S.; Chung-Hsiung Li, B.S.; Shih-Chang Lin, M.S.; Niren Nagda, M.A.; Eugene Ryan, B.S.; Divakar Shenoy, M.S.; H.T. Shu, M.S.; Kunihisa Soda, M.S.; Pugalur V. Sudhindra, M.S.; Samuel Wong, B.S.; Sang Sin Yoo, M.S.; Shu-Chien Yung, M.S.

The Department of Information Engineering

Professors: Bruce H. McCormick, Ph.D., Head of the Department; Robert Arzbaecher, Ph.D.; Earl E. Gose, Ph.D.; Philip Parzen, Ph.D.; Chathilingath K. Sanathanan, Ph.D.

Associate Professors: Chu-Quon Lee, Ph.D.; Tadao Murata, Ph.D.; Henry A. Setton, M.I.E.; Herbert J. Stein, Ph.D., Piergiorgio L.E. Uslenghi, Ph.D.; Bert L. Zuber, Ph.D.

Assistant Professors: Yun-Leei Chiou, Ph.D.; Roger C. Conant, Ph.D.; Rucelle L. Consigny III, Ph.D.; William DeFotis, M.S.; Robert A. Dell, Jr., Ph.D.; John D. Ferguson, Ph.D.; Hitoshi Inada, Ph.D.; Philip L. Katz, Ph.D.; Sharadbabu R. Laxpati, Ph.D.; Miljenko Orsic, Ph.D.; Roland Priemer, Ph.D.; John L. Semmlow, Ph.D.; Thomas M. Smith, M.S.; Stephen Tsai, Ph.D.

Instructors: Allen A. Sandberg, M.S.

Assistants: John R. Andrews, B.S.; Michael W. Bartnick, B.S.; Raymond Christian, B.S.; Daniel Elyashar, B.S.; Joseph T. Ennesser, B.S.; Fred J. Gunther, M.S.; Gregory N. Hesse, B.S.; Soon A. Kang, B.S.; James G. Lewis, B.S.; Chung-Wing Ng, B.S.; James C. Stamm, B.S.; Wing-Fat Yeung, B.S.;

Department of Materials Engineering

Professors: Ernest F. Masur, Ph.D., Head of the Department; Thomas H. Blewitt, Sc.D.; Robert F. Domagala, M.S.; James M. Doyle, Ph.D.; Gordon H. Geiger, Ph.D.; David W. Levinson, Ph.D.; William Rostoker, Ph.D.; John A. Schey, Ph.D.; Albert B. Schultz, Ph.D.; Thomas C.T. Ting, Ph.D.

Associate Professors: Donald G. Lemke, Ph.D.; Paul E. Mast, Ph.D. (Adjunct); Roy B. Perkins, M.S.; Daniel F. Schoeberle, Ph.D.; Surrendra P. Shah, Ph.D.; Charles A. Timko, Ph.D., (Adjunct); Otto E. Widera, Ph.D.; Chien-Heng Wu, Ph.D.

Assistant Professors: Ted B. Belytschko, Ph.D.; Graham M. Brown, Ph.D.; Robert H. Bryant, Ph.D.; Lawrence E. Carlson, Ph.D.; Marshall L. Silver, Ph.D.; Fred Webster, Ph.D.; Michael J. Weins, Ph.D.

Adjunct Research Professors: Jorge O. Galante, M.D.

Assistants: Thomas P. Andriacchi, M.S.; Olimpio F. Angeles, Jr., M.S.; Carson H. Boatright, B.S.; Charles E. Freda, B.S.; Lawrence W. Glaum, M.S.; Thomas J. Gloviak, B.S.; Ronald F. Kulak, M.S.; Jaw S. Lan, M.S.; William T.C. Li, M.S.; Daryl L. Logan, M.S.; Alan H. Lonn, B.S.; Rajagopal Namperumal, M.S.; Taekyun Park, B.S.; Carl W. Pretzel, B.S.; Eberhardt Privitzer, B.S.; Leon J. Przybyla, B.S.; Thomas F. Restivo, B.S.; Dan T. Rickhoff, B.S.; Muthukrishnan G. Srinivasan, M.S.; Bock H. Yee, B.S.

The Department of Systems Engineering

Professors: Joseph H. Engel, Ph.D., Head of the Department; George Bugliarello, Sc.D.; H. Dale Walraven, M.A.

Associate Professors: Gyan C. Agarwal, Ph.D.; Lyndon R. Babcock, Ph.D.; Richard C. Kohler, Ed.D.; William D. O'Neill, Ph.D.; Fred W. Schroeder, M.S.

Assistant Professors: Edward J. Caldario, M.S.; Marion V.J. Dembski, M.A.; Yehuda Gur, Ph.D. (Visiting); Floyd G. Miller, Ph.D.; Francis A. Mosillo, M.S.; Assistant Head for Administration; Nancy L. Nihan, Ph.D.; Edward W. Walbridge, Ph.D.

Instructors: Deepak Bammi, Ph.D.; Nancy J. Conrad, M.S.; Robert Pancner, B.S.

Graduate Assistants: Kivanc Orengil, B.S.; Leonard E. Schwer, B.S.; Shu-Ho Yung, B.S.

The Bioengineering Program

Professors: Irving F. Miller, Ph.D., Head of the Bioengineering Program; Earl E. Gose, Ph.D.

Associate Professors: B.L. Zuber, Ph.D.

Assistant Professors: John L. Semmlow, Ph.D.; Ike J.S. Hung, Ph.D.

Assistants: Ranjan C. Jain, M.S.

Emeriti of the College

Professors: Clarence I. Carlson, B.S., General Engineering; Arnold C. Cobb, M.S., Thermodynamics; Henry L. Garabedian, Ph.D., Mathematics and Energy Engineering; Norman A. Parker, M.S., Mechanical Engineering; Samuel E. Shapiro, B.S., Systems Engineering; Frederick W. Trezise, M.A., Engineering Science, Associate Dean of the College.

Associate Professors: Leon N. Blair, B.S., General Engineering; Edward H. Coe, C.E., Civil Engineering; Dee M. Holladay, B.S., General Engineering.

Assistant Professors: Truman C. Buss, B.S., General Engineering; Richard S. Royster, M.A., General Engineering.

Undergraduate Study in Engineering and Engineering Sciences

The function of the engineer, both in industry and in government, is becoming increasingly broad; problems must by solved and advice must be given that cover diffuse, and often seemingly unrelated, areas of specialization. Furthermore, within the context of modern demands the traditional engineering classifications have lost much of their relevance.

In recognition of this trend and in an effort to anticipate future developments, the College of Engineering offers a general undergraduate program that leads to either the Bachelor of Science in Engineering or the Bachelor of Science in Engineering Science. Engineering-degree studies are oriented toward professional engineering practices, while a more theoretical understanding of engineering and technology is emphasized in the studies that lead to the baccalaureate in engineering science. In designating only these two all-encompassing degrees, the College of Engineering also gives recognition to one of its principal educational philosophies, namely, to allow the student the maximum possible freedom in organizing his educational program to suit his specific needs and interests.

Some course programs are considered indispensable and are therefore mandatory for all students. They include, first of all, approximately one-half year of work in the general fields of the *humanities and social sciences.* Because the engineer and the engineering scientist are no longer narrow specialists, they cannot afford to ignore the effect of their work on the general welfare of society. The humanities-social sciences phase of their education helps them to orient themselves toward becoming conscious contributors to the general welfare.

All engineering and engineering science areas require familiarity with certain basic fundamentals that the *Common Core Curriculum* provides for candidates for either degree. This mandatory Common Core Curriculum, comprising slightly more than two years of work, includes instruction in mathematics and the physical sciences and an introduction to basic engineering sciences, such as mechanics, materials, thermodynamics, electronics and circuits, and systems analysis. For engineering degree candidates there is also included in this mandatory portion of the curriculum two senior-level courses in design, which provide an integrative, creative experience at an advanced level. These design courses are not intended to further elucidate or apply advanced theories per se but rather to simulate actual engineering design experience.

A package of approximately one year of work in an *area of concentration* is included in the requirements for either degree. This package usually represents the technical phase of the student's interest and constitutes a cohesive program of advanced work that best suits his needs and aspirations.

Requirements for either degree are completed with approximately one-half year of *free electives* that are often predominantly technical; however, they may also be nontechnical, particularly if the student decides to pursue a career in which his services will be broadly based and society oriented.

The Common Core Curriculum

Required of all students, the 108-quarter hour Common Core Curriculum consists primarily of courses of study common to all branches and specializations — courses in mathematics, physics, chemistry, and the engineering sciences.

The first two years of academic work for the typical undergraduate student contain the following required Common Core Curriculum courses:

First Year

First Quarter	*Hours*
Mathematics 130—Calculus I	5
Systems Engineering 155—Principles of Systems Engineering I	4
Chemistry 112—Chemical Bonding and Structure OR English Composition 101	5 or 4
Elective	4
Second Quarter	
Mathematics 131—Calculus II	5
Systems Engineering 225—Principles of Systems Engineering II	3
Chemistry 112—Chemical Bonding and Structure OR Chemistry 113—Equilibria: Chemistry of Solutions	5
English Composition 101 or 102	4
Third Quarter	
Mathematics 132—Calculus III	5
Physics 131—Classical Physics I (Mechanics)	4
Systems Engineering 150—Graphical Methods	2
Chemistry 113—Equilibria: Chemistry of Solutions OR English Composition 102	5 or 4

Second Year

First Quarter	*Hours*
Mathematics 133—Calculus IV	5
Materials Engineering 200—Statics and Dynamics	4
Materials Engineering 230—Properties of Materials	4
Physics 132—Classical Physics II (Electrodynamics)	3
Second Quarter	
Mathematics 220—Elementary Differential Equations I	3
Materials Engineering 201—Introduction to Solid Mechanics	3
Information Engineering 210—Introduction to Circuit Theory	4
Information Engineering 211—Introduction to Circuit Theory Laboratory	1
Energy Engineering 201—Thermodynamics	5
Third Quarter	
Information Engineering 240—Introduction to Electronic Systems	4
Materials Engineering 202—Introduction to Experimental Mechanics	2
Energy Engineering 211—Fluid Mechanics	4
Mathematics 195—Introduction to Automatic Digital Programming	3

Additional Common Core Curriculum Courses

Physics 231—Modern Physics I	4
Physics 232—Modern Physics II	5
†EnrE/InfE/MatE/SysE/ 396—Senior Design I	4
†EnrE/InfE/MatE/SysE/ 397—Senior Design II	4

Common Core Curriculum Regulations

All engineering students are expected to complete all Common Core Curriculum course work as soon as possible.

1. A student who is a candidate for the *Bachelor of Science in Engineering* must complete all other Common Core Curriculum courses before he will be allowed to enroll in the first Common Core Curriculum design course.

2. A student who is a candidate for the *Bachelor of Science in Engineering Science* must complete all of the Common Core Curriculum courses except the design courses before he will be allowed to enroll in senior-level courses in his area of concentration.

†Required only for the *Bachelor of Science in Engineering degree.* An Engineering Science degree candidate may substitute technical courses in the College of Engineering if he does not desire to complete the design sequence.

Area of Concentration Requirements

In addition to other degree requirements, each student must complete approximately 40 quarter hours of work in an area of concentration. In some areas of concentration the required number of hours are more or less than 40. In these cases, the required number of free elective hours is reduced or increased accordingly.

Shortly after the student enrolls in the College, he is assigned a faculty adviser. Before he completes the Common Core Curriculum, he will be required, in consultation with his adviser, to choose a cohesive package of appropriate courses. Descriptions of the following areas of concentration begin on page 124.

Bachelor of Science in Engineering:

Aerospace and Fluids Engineering
Bioengineering
Chemical Engineering
Communication Engineering
Computer Systems
Electromagnetic and Electronic Engineering
Environmental Engineering
Manufacturing Engineering
Mechanical Analysis and Design
Metallurgy
Socio-Technological Systems Engineering
Structural Engineering and Materials
Thermomechanics and Energy Conversion

Bachelor of Science in Engineering Science:

Applied Mechanics
Engineering Physics

The Individualized Area

An additional area of concentration is the Individualized Area, which leads to the Bachelor of Science in either Engineering or Engineering Science. The student who finds none of the foregoing areas to be appropriate for his career goals may select the Individualized Area, and, in consultation with a faculty adviser, formulate a suitable program of study. For example, by judicious selection of courses, a student can pursue a program of study pertinent to such fields as plant or production engineering, sales engineering, or environmental science and engineering. In each case the program formulated must meet the requirements for an area of concentration and must be approved by the college faculty and the Dean. All programs so approved are then available to students who subsequently select the Individualized Area of Concentration.

Admission to Area of Concentration Studies

A student may declare an area of concentration after 60 quarter hours of course work and must declare an area after 90 quarter hours of course work. In order to begin studies in an area of concentration, the student must petition the appropriate curriculum committee. In general, to be admitted to area of concentration studies the student must have achieved a 3.000 grade-point average in the total of all physics, chemistry, mathematics, engineering science, and engineering course work completed up to that time. However, the final decision for admittance rests with the curriculum committee. If the 3.000 grade-point average requirement is not met, the committee may relax the requirement, may recommend additional course work, or may recommend that courses be repeated.

Humanities and Social Sciences

To satisfy the requirements for either degree, a student must complete 24 quarter hours in courses in the humanities and the social sciences. He must complete a sequence of at least 8 quarter hours in the humanities and a sequence of at least 8 quarter hours in the social sciences. The additional courses required to complete the 24-quarter-hour requirement may be taken in either the humanities or the social sciences.

Sequences and courses recommended by the College follow. In addition, the student has the option, in consultation with his adviser, of developing an individualized program of sequences and courses in the humanities and the social sciences that includes courses not on this list. In general, any course numbered *higher* than the courses on the list is allowable provided the student satisfies the prerequisites for the course and it is in the humanities or the social sciences.

Courses in accounting, industrial management, finance, personnel administration, introductory language (see *Free Electives* for an explanation of foreign language credit), and R.O.T.C. are *not* humanities courses and *cannot* be used to satisfy the humanities and social sciences requirements. However, such courses may be taken as free electives.

Humanities and Social Sciences Sequences

Humanities

Classics 248
History of Architecture and Art 115, 142, 143, 144
English 101, 102, 103
English 131
English 150, 151, 152
French 104, 105, 106
German 104, 105, 106
Greek, 104, 105, 106
History 101
History 111
History 296
Humanities 104, 105, 106
Information Engineering 201
Latin 104, 105, 106
Music 130, 131
Philosophy 101, 102, 103
Philosophy 150
Philosophy 222
Russian 104, 121, 122
Spanish 104, 105, 106
Speech and Theater 121, 122, 123

Social Sciences

Administration of Criminal Justice 101, 102
Anthropology 130, 150, 160
Economics 120, 121
Economics 324
Geography 110, 120
History 151
Political Science 150
Political Science 318, 319
Psychology 100, 101
Sociology 100, 110, 120
Speech 111, 112, 113

Free Electives

Each student must complete a block of approximately 20 quarter hours of free-elective courses, depending on his area of concentration, while maintaining a reasonable balance between technical and nontechnical work. Free electives are selected in consultation with an adviser. Students in the Military Officer Training Program are allowed 5 quarter hours of free-elective credit if they complete the entire four-year program.

A maximum of 3 hours of free-elective credit in physical education is allowed.

As noted, introductory language courses (101, 102, 103) do not satisfy the 8 quarter hours of humanities requirement. However, if the adviser consents, they may be taken for free-elective credit under the following provisions: If the student continues a language begun in high school, credit is determined on the basis of both placement test results and the amount of high school work completed—

If he presents two years of high school credit, he receives credit for a 101 course provided he places in a 101 course.

If he presents three years of high school credit, he receives credit for the course in which he places provided it is not below the 102 level.
If he presents four years of high school credit, he receives credit for the course in which he places provided it is not below the 104 level.

Graduation Requirements

The Bachelor of Science in Engineering or the Bachelor of Science in Engineering Science is awarded upon the satisfactory completion (see paragraph below) of 192 quarter hours of credit. These hours (discussed in detail elsewhere in this section) include 108 hours in the core curriculum; approximately 40 hours in the area of concentration; 24 hours in the humanities and the social sciences; and approximately 20 hours in free electives.

To receive a degree, a student is required to achieve a 3.000 grade-point average in the total of all course work in physics, chemistry, mathematics, engineering science, engineering, and courses in his area of concentration. In addition, all of the general University requirements for graduation must be met. See *General University Requirements.*

College Graduation Honors

At graduation, students are awarded College Honors for academic distinction. Such honors are designated on the diploma as Honors, High Honors, or Highest Honors.

Honors are awarded to a student who earns at least a 4.0 cumulative grade-point average; High Honors are awarded to a student who earns at least a 4.3 grade-point average; Highest Honors are awarded to a student who earns at least a 4.7 grade-point average. All transfer work is included in the determination of grade-point averages. *Excluded* are the grades from required physical education courses and military science courses.

Admission to the College of Engineering

For details of entrance requirements and dates for filing an application for admission to the University, see page 35 and 45.

Transfer Students

The College of Engineering admits qualified transfer students from other institutions. The prospective transfer student whose courses most nearly parallel the offerings at Chicago Circle in content and credit hours effects the transfer most easily. To the extent possible, a transfer student from a two-year community college should concentrate on the following course work before he transfers into the College of Engineering.

1. English composition
2. Chemistry, equivalent to Chemistry 112 and 113 at Chicago Circle
3. Physics for engineers, emphasizing mechanics and electricity and magnetism (with calculus as a prerequisite)
4. Mathematics through differential equations

The Mathematics and Chemistry Placement Tests

A new student who enters the College of Engineering must take the Mathematics Placement Test unless he has completed college-level work in algebra and trigonometry with grades of D or above. Transfer students who present such college-level credit are required to take the Mathematics Placement Test at the discretion of the Dean of the College of Engineering.

Each student who presents high school credit in chemistry must take the Chemistry Placement Test. If he has taken one year of high school chemistry and is adequately prepared, as shown by the placement examination, he takes Chemistry 112. Students who have not had high school chemistry take Chemistry 111. Credit toward graduation is not given in the College of Engineering for courses numbered *lower* than Chemistry 112 and Mathematics 130.

The Cooperative Engineering Education Program

The College of Engineering offers a cooperative education program that is a coordinated, alternating work and study program that provides an opportunity for the undergraduate student not only to acquire academic knowledge but also to obtain practical experience in the field. Interested students are invited to interview participating companies during the sophomore year. On-the-job experience usually starts during the summer following the sophomore year. Further information on the program is available from the College Office.

Approved Areas of Concentration and Required Courses*

Aerospace and Fluids Engineering—*(Bachelor of Science in Engineering)*

The goal of this area of concentration is to produce an engineer capable of designing devices and analyzing phenomena governed by the engineering disciplines of applied fluid mechanics, heat transfer, thermodynamics, and structural dynamics. Synthesis is achieved in the aerospace applications of propulsion or flight dynamics and in the study of engineering problems related to oceanic or atmospheric flows.

The courses include theoretical work, design problems, and laboratory exercises based on applications from many engineering disciplines. Career opportunities are found in government agencies and private companies concerned with fluid and energy distribution systems, aircraft design, propulsion and combustion devices, turbo machinery, oceanography, meteorology, and biofluid mechanics.

*A student may make minor revisions in his area of concentration with the approval of his adviser, the appropriate curriculum committees, and the Dean of the College.

Required Courses	*Quarter Hours*
EnrE 212—Potential Flow	4
EnrE 213—Compressible Flow	4
EnrE 214—Viscous Fluid Mechanics	4
EnrE 221—Heat Transfer	4
EnrE 241—Experimental Methods in Solid and Fluid Mechanics	4
MatE 204—Mechanics of Solids I	4
MatE 206—Mechanics of Solids III	4
MatE 208—Mechanical Vibrations	4
One of the following two courses:	
EnrE 313—Flight Dynamics: Stability and Control	4
EnrE 314—Propulsion	4
One of the following two courses:	
EnrE 311—Ocean and Estuary Hydrodynamics	4
EnrE 361—Atmospheric Motions	4

Applied Mechanics—*(Bachelor of Science in Engineering Science)*

This area of concentration represents one of the principal foundations of engineering science; therefore, the curriculum area in applied mechanics is designed to give a student a broad introduction to the scientific basis of much of modern engineering practice and research. Although graduates with this specialty should have no difficulty in entering a variety of positions in industry, applied mechanics has particular appeal to students whose strong analytical or experimental research interests point to the likelihood of further study at the graduate level.

The required courses consist primarily of offerings in the Departments of Materials Engineering, Energy Engineering, and Mathematics, which introduce a student to the fundamentals of solid and fluid mechanics and to the mathematical tools needed for these disciplines. If he so desires, a student may use free elective hours to specialize in accord with his needs and interests during his senior year.

Required Courses	*Quarter Hours*
MatE 204—Mechanics of Solids I	4
MatE 206—Mechanics of Solids III	4
MatE 208—Mechanical Vibrations	4
MatE 211—Dynamics of Rigid Bodies	4
EnrE 212—Potential Flow	4
EnrE 214—Viscous Fluid Mechanics	4
MatE 241—Experimental Methods in Solid and Fluid Mechanics	4
MatE 311—Intermediate Dynamics	4
MatE 316—Introduction to Continuum Mechanics	4
Math 310—Higher Analysis	4

Bioengineering—*(Bachelor of Science in Engineering)*

Bioengineering represents the interface between the engineering and life sciences. Training in this area prepares students for either graduate school or medical school or for positions in the aerospace, pharmaceutical, medical electronics, and automotive industries.

In bioengineering education, which provides a student with a basic engineering and biological background, students take advanced engineering and biological sciences courses in the area of concentration package and as free electives. Bioengineering courses and research projects include the application of the theories of information, communication, and control to living systems; cybernetics and artificial intelligence; bioinstrumentation and artificial organs; some aspects of biophysics; and digital computer applications in biology and medicine.

Required Courses			*Quarter Hours*
InfE 212—Signal Processing			4
InfE 311—Linear System Analysis			4
InfE/BioS 100—General Biology	4		
InfE/BioS 101—General Biology	4	two of three	8
InfE/BioS 102—General Biology	4		
InfE/BioS 280—Vertebrate Morphogenesis			5
InfE 383/BioS 363—Animal Physiology I	5		
or			5
InfE 384/BioS 364—Animal Physiology II	5		
16 hours from the following courses:			
InfE 200—Introduction to Bioengineering	4		
InfE 292—Undergraduate Research	4		
InfE 307—Cybernetics I	4		
InfE 350—Prostheses and Artificial Organs	4		
InfE 352—Biocontrol	3		
InfE 353—Biocontrol Laboratory	3		16
InfE 354—Bioinstrumentation Transducers	4		
InfE 356—Medical Biophysics	4		
InfE 379—Real-Time Data Processing	4		

Chemical Engineering—*(Bachelor of Science in Engineering)*

Chemical engineering deals with the technology of using chemical and physical processes to convert naturally occurring raw materials into final consumer products. By combining the art of industrial technology with modern concepts of science and engineering, it is possible to bring about the realization of processes developed in the laboratory for the production of pharmaceuticals, foods, plastics, and other chemicals.

The chemical engineering program includes inorganic, organic, and physical chemistry as well as the basic principles of the engineering sciences of fluid mechanics, heat transfer, thermodynamics, mass transfer, and chemical reaction engineering.

Electives in chemical engineering can be chosen from the offerings of the several departments. The 7 hours of free electives may be selected in consultation with the adviser.

Required Courses	*Quarter Hours*
Chem 121—Analytical Chemistry	5
Chem 232—Organic Chemistry I	4
Chem 233—Organic Chemistry II	4
Chem 234—Organic Chemistry Laboratory I	1
Chem 236—Organic Chemistry Laboratory II	1
Chem 340—Physical Chemistry I	4
Chem 341—Physical Chemistry Laboratory I	2
Chem 342—Physical Chemistry II	4
EnrE 232—Material and Energy Balances	3
EnrE 234—Heat and Momentum Operations	4
EnrE 235—Chemical Engineering Laboratory I	2
EnrE 237—Chemical Engineering Laboratory II	2
EnrE 285—Equilibrium Stage Separations	3
EnrE 286—Chemical Reaction Engineering	4
EnrE 287—Mass Transfer Operations	3
EnrE 331—Chemical Engineering Thermodynamics	4
EnrE 345—Chemical Process and Energy Conversion Control*	3

*Final approval for this course is pending.

Communication Engineering—*(Bachelor of Science in Engineering)*

In this area of concentration the junior year provides a concise, modern approach to several areas of electrical engineering, including signal processing, linear analysis, introductory communication theory, electronics, and wave propagation and radiation. Senior-level work can be planned for specialization in at least one of the following areas:

A. Network Analysis and Synthesis
B. Communication Theory
C. Electronic Applications
D. Automatic Control Theory

Required Courses	*Quarter Hours*
InfE 212—Signal Processing	4
InfE 219—Fields and Waves I	4
InfE 221—Fields and Waves II	4
InfE 311—Linear Systems Analysis	4

Completion of one of the following alternate course sequences:	*A*	*B*	*C*	*D*
InfE 312—Introduction to Communications Engineering	4	4	4	4
InfE 315—Intermediate Network Analysis	4			
InfE 316—Introduction to Network Synthesis	4			
InfE 320—Fields and Waves III	4	4	4	4
InfE 330—Communication Theory I		4		
InfE 331—Communication Theory II		4		
InfE 340—Electronic Circuits	4	4	4	4
InfE 346—Semiconductor Electronics	4	4	4	4
InfE 344—Electronic Applications I			4	
InfE 345—Electronic Applications II			4	
InfE 360—Automatic Control Theory I				4
InfE 361—Automatic Control Theory II				4

Computer Systems—*(Bachelor of Science in Engineering)*

This area of concentration is a fusion of certain areas in electrical engineering and mathematics. Beginning in the junior year, a student takes courses in signal processing, linear analysis, introductory communication theory, and electronics; he also completes a block of mathematically oriented courses dealing with numerical analysis techniques and the theory of computing machines. A student may use his elective courses to emphasize, in either engineering or mathematics, subjects of additional interest to him.

Required Courses		*Quarter Hours*
InfE 212—Signal Processing		4
InfE 219—Fields and Waves I		4
InfE 311—Linear Systems Analysis		4
InfE 312—Introduction to Communication Engineering		4
InfE 340—Electronic Circuits		4
InfE 371—Switching Networks and Logical Design		4
InfE 372—Design of Digital Systems		4
InfE 373—Computer Organization and Architecture		3
Math 348—Linear Transformation and Matrices		5
At least one of the following courses:		
Math 387—Numerical Analysis I	3	
Math 394—Simulation Language	3	
Math 395—List-Processing Languages	3	3
Math 396—Design of Compilers	3	
Math 397—Computer Operating Systems	3	
InfE 379—Real-Time Data Processing	4	

Electromagnetic and Electronic Engineering *(Bachelor of Science in Engineering)*

This area of concentration deals with a broad study of electrical devices. Students can specialize in one or more of three areas: electronics, electromagnetics, and electromechanics. During the senior year, students may plan advanced work in microwave devices, antennas and radiating systems, semiconductor devices, electromechanical devices, and electronic circuit design of components, instruments, and systems used widely by government and industry.

Required Courses	*Quarter Hours*
InfE 212—Signal Processing	4
InfE 219—Fields and Waves I	4
InfE 221—Fields and Waves II	4
InfE 311—Linear Systems Analysis	4
InfE 320—Fields and Waves III	4
InfE 340—Electronic Circuits	4
InfE 346—Semiconductor Electronics	4

Any three of the following courses:

InfE 324—Principles of Microwaves	4	
InfE 325—Antenna Engineering and Wave Propagation	4	
InfE 326—Microwave Semiconductor Electronics	4	
InfE 344—Electronic Applications I	4	
InfE 345—Electronic Applications II	4	
InfE 347—Thin Film Devices	4	12
InfE 348—Field Effect Devices	4	
EnrE 351—Electromechanical Energy Conversion I	4	
EnrE 352—Electromechanical Energy Conversion II	4	
EnrE 353—Direct Energy Conversion	4	

Engineering Physics *(Bachelor of Science in Engineering Science)*

This area, which provides engineering students with a strong background in physics, concentrates on fundamental topics for those students who intend to pursue a career in physics or in one of the physics-oriented areas of engineering.

Required Courses	*Quarter Hours*
InfE 219—Fields and Waves I	4
InfE 221—Fields and Waves II	4
InfE 340—Intermediate Electronics	4
InfE 346—Semiconductor Electronics	4
EnrE 305—Statistical Thermodynamics	4
MatE 316—Introduction to Continuum Mechanics	4
Physics 321—Quantum Mechanics I	4
Physics 322—Quantum Mechanics II	4
Physics 381—Modern Experimental Physics I	4
One of the following courses:	4

Physics 323—Elementary Solid State Physics	4	
Physics 331—Nuclear Physics	4	
Physics 382—Modern Experimental Physics II	4	

In addition, students may elect to take either the core curriculum design courses (8 hours) or two courses from the following (these courses may be replaced by other College of Engineering courses if the adviser consents):

EnrE 304—Transport Phenomena	4	
EnrE 307—Kinetic Theory of Gases and Transport Phenomena	4	
EnrE 341—Experimental Methods and Techniques	4	
InfE 327—Modern Linear Optics	4	8
InfE 347—Thin Film Devices	4	
MatE 311—Intermediate Dynamics	4	

Environmental Engineering—*Bachelor of Science in Engineering*

Environmental engineering is concerned with the basic engineering principles necessary to measure, analyze, and control man's environment. The student is provided with the background for solving environmental and related problems through the application of the fundamentals of physics, chemistry, thermodynamics, and fluid mechanics. Course subject matter varies from the applied aspects of meteorology and oceanography to air and water pollution-control technology. Environmental engineering is an interdisciplinary area that encourages electives in biology, geology, chemistry, economics, and public health.

Potential employment opportunities include governmental agencies and industries concerned with the monitoring of atmospheric pollutants, industrial pollution-control technology, oceanographic engineering, urban meteorology, water purification and sanitation, earth-resources satellites, solid waste disposal, and water resource planning.

All students are required to take a common course package followed by one of two optional paths. The air and water resources option is concerned with the geophysical environment and is designed for those students interested in applied meteorology, hydrology, and oceanography. The pollution control technology option is designed for students interested in industrial pollution control, sanitary engineering, and statistical analysis for resource management.

Courses Required for Both Options	*Quarter hours*
Chem 121—Analytical Chemistry	5
EnrE 202—Intermediate Thermodynamics or	
EnrE 331—Chemical Engineering Thermodynamics	4
EnrE 232—Material and Energy Balances	3
EnrE 261—Introduction to Environmental Pollution Control	4
One of the following:[1]	4
EnrE 371[2]—Air Resources Engineering	
EnrE 372—Water Resources and Pollution Control	
MatE 381—Noise and Vibration Control	
	20

Air and Water Resources Option	
EnrE 214—Viscous Fluid Mechanics	4
EnrE 215—Engineering Hydrology or	4
GeolS 350—Hydrogeology	
EnrE 217—Introduction to Meteorology	4
EnrE 311—Ocean and Estuary Hydrodynamics	4
EnrE 361—Atmospheric Motions	4
	20

[1] A course in solid waste engineering is being developed for future inclusion.

[2] Final approval for this course is pending.

Pollution Control Technology Option

EnrE 234—Heat and Momentum Operations	4
EnrE 235—Chemical Engineering Laboratory I	2
MatE 338—Particulate Solids Processing	4
Math 250—Statistics for Engineers	5
SysE 345—Modeling in Socio-Technological Systems	4
	19

Manufacturing Engineering *(Bachelor of Science in Engineering)*

The manufacture of finished products involves interrelationships among machine design, machine control, fabrication, and service properties of materials as they relate to efficiency, productivity, quality, and cost. This area of concentration includes courses in basic machine-design principles associated with measuring and machine capability, the application of computer methods and related equipment to machine control, the influence of materials on the process and vice versa, the selection of materials to meet service requirements, and the relation of economics to materials and process selection.

This specialization is aimed at educating engineers to enter the wide spectrum of manufacturing industries engaged in producing finished components and assemblies of components that represent marketable products.

Required Courses	*Quarter Hours*
MatE 255—Physical Metallurgy Laboratory III	1
QM 270—Statistics	4
Mgmt 350—Operation and Administration	4
MatE 246—Numerical Control Processing	4
MatE 249—Materials Processing IV	4
MatE 271—Measurement Reliability in Manufacturing	4
MatE 244—Materials Processing II	4
MatE 245—Materials Processing Laboratory II	1
MatE 248—Materials Processing I	4
MatE 333—Design Use of Materials	4
MatE 360—Deformation Processing	4
MatE 361—Deformation Processing Laboratory	2

Mechanical Analysis and Design *(Bachelor of Science in Engineering)*

This area of concentration acquaints a student with the fundamental disciplines involved in the design of machinery. An engineering graduate with this option is likely to be employed by any one of many manufacturing industries.

To afford a student a wide choice in the selection of his career as well as to enable him to keep up with developments in industry after graduation, this option emphasizes fundamentals, which include the study of stress analysis, mechanical vibrations and mechanisms, and the design use of materials. In his senior year a student completes a comprehensive design project in which the

knowledge accumlated in his previous course work is utilized and synthesized. The problems selected are often taken from actual industrial job assignments, and their solutions are viewed against the same type of background.

Required Courses			*Quarter Hours*
MatE 204—Mechanics of Solids I			4
MatE 206—Mechanics of Solids III			4
MatE 208—Mechanical Vibrations			4
MatE 211—Dynamics of Rigid Bodies			4
MatE 241—Experimental Methods in Solid and Fluid Mechanics			4
MatE 311—Intermediate Dynamics			4
MatE 209—Analysis and Synthesis of Mechanisms I			4
MatE 333—Design Use of Materials			4
MatE 313—Dynamics of Machinery			4
One of the following courses:			
MatE 282—Design of Machine Elements I	4		
MatE 304—Experimental Stress Analysis	4		
MatE 308—Intermediate Vibration Theory	4		4
MatE 383—Design of Film Bearings	4		

Metallurgy *(Bachelor of Science In Engineering)*

In addition to the production of materials, metallurgists are employed in the developmental and manufacturing aspects of the machine, automotive, aircraft, chemical, electronic, and electrical industries. In this area of concentration, approximately one-half of the allocated hours is devoted to engineering science (physics of metals, physical metallurgy, thermodynamics, investigative techniques) and the remainder to technology (deformation processing, casting, joining, heat treatment, design use, and extraction from minerals). In addition, students are encouraged to enrich their education in the areas of machining, computer techniques, cost analysis, and operations analysis.

Required Courses	*Quarter Hours*
MatE 250—Physical Metallurgy I	3
MatE 253—Physical Metallurgy Laboratory I	1
MatE 251—Physical Metallurgy II	3
MatE 254—Physical Metallurgy Laboratory II	1
MatE 252—Physical Metallurgy III	3
MatE 255—Physical Metallurgy Laboratory III	1
MatE 239—X-Ray Metallography I	3
MatE 291—Undergraduate Seminar	1
MatE 243—Metallurgical Problems	5
MatE 248—Materials Processing I	4
MatE 360—Deformation Processing	4
MatE 361—Deformation Processing Laboratory	2
MatE 244—Materials Processing II	4
MatE 245—Materials Processing Laboratory II	1
MatE 333—Design Use of Materials	4

Socio-Technological Systems Engineering *(Bachelor of Science in Engineering)*

Socio-technological systems engineering is a broad field of study that deals with the physical characteristics of systems and the attitudes, reactions, motivations, and values of the people who interact with them. Such systems are frequently encountered in industry and in government agencies and public institutions. The sequence of required courses in this area is divided into two parts. A general sequence is required for all students in this area. Students then may specialize by taking courses in one of four recommended sequences: systems analysis and design, industrial engineering, operations research, or urban systems engineering.

The systems analysis and design sequence provides an introduction to systems engineering and a broad basis for the analysis of complete physical and socioeconomic systems as distinguished from components of such systems. Industrial engineering is concerned with the design, improvement, and installation of integrated systems of men, materials, and equipment. It draws upon specialized knowledge and skill in the mathematical, physical, and social sciences, together with the principles and methods of engineering analysis and design, to specify, predict, and evaluate the results to be obtained from such systems. The operations research sequence presents the viewpoint and methodologies required to permit the study of actual man-machine systems under real or hypothetical operating conditions, so that optimal system configurations for novel operating conditions may be determined. The urban systems engineering sequence covers the analysis and design of large-scale social systems, such as transportation systems, health care systems, and the like, by devising mathematical models of urban systems and strategies for the evaluation of alternative urban programs that may be used for urban planning and development.

General Sequence	*Quarter Hours*
SysE 342—Experimental Design	4
SysE 345—Modeling in Socio-Technological Systems	4
SysE 371—Optimization Techniques I	4
SysE 335—Urban Systems I (for students in Urban Systems only) 4	
or	4
SysE 350—Stochastic Processes (For students not in the Urban Systems sequence) 4	

Systems Analysis and Design Sequence	
SysE 315—Dynamic Systems Analysis I	4
SysE 316—Dynamic Systems Analysis II	4
SysE 341—Man-Machine Systems	4
SysE 372—Optimization Techniques II	4
Econ 320—Macroeconomic Theory	4
InfE 312—Introduction to Communciation Engineering	
or	4
InfE 360—Automatic Control Theory I	

Structural Engineering and Materials *(Bachelor of Science in Engineering)*

With the advent of the electronic computer, the function of the structural designer has undergone a fundamental change. Routine calculations, drafting, and other necessary chores are now largely delegated to nonengineers. The structural engineer, with the help of the computer, concentrates on the true job of "design," that is, to determine the best possible solution to satisfy the needs of society for housing, hospitals, factories, bridges, and other structures.

These changes are incorporated in the structural options. In addition to a brief introduction to the design practices and codes that affect various common structural materials, such as steel and reinforced concrete, the program primarily emphasizes structural theory, the properties of structural materials, and the use of the computer for solving problems in design.

Because of the breadth of the subject and the wide variety of possible job selections, the student in this option is given some choice of further specialization. He may, for example, concentrate on courses that emphasize the structural design practices that relate to the construction industry, or he may study more advanced aspects of structural theory to be able to handle the more exacting requirements of such structures as airplanes or nuclear containers. He may finally select additional courses in soil mechanics in preparation for a career as a soil and foundation engineer.

Required Courses	*Quarter Hours*
MatE 203—Composition and Properties of Concrete	4
MatE 204—Mechanics of Solids I	4
MatE 205—Mechanics of Solids II	4
MatE 207—Structural Analysis I	4
MatE 260—Soil Behavior I	4
MatE 261—Soil Behavior II	4
MatE 221—Behavior and Design of Metal Structures	4
MatE 225—Design of Concrete Structures	4
Any two of the following courses:	8
MatE 302—Applied Elasticity I	4
MatE 316—Introduction to Continuum Mechanics	4
MatE 321—Structural Analysis II	4
MatE 324—Limit Analysis and Design of Structures	4
MatE 325—Concrete Design of Shell and Plate Structures	4
MatE 326—Design in Prestressed and Precast Concrete	4
MatE 322—Concrete Technology I	4
MatE 344—Physical-chemical Principles of Soil Behavior I	4
MatE 370—Soil Mechanics I	4
MatE 371—Soil Mechanics II	4
MatE 372—Soil Mechanics III	4
MatE 373—Laboratory Determination of Shear Strength of Soils	2

Industrial Engineering Sequence

SysE 347—Industrial Engineering	4
SysE 348—Industrial Engineering II	4
Econ 321—Microeconomic Theory	4
Econ 322—Managerial Economics	4
Mgmt 350—Organization and Administration	4
Mgmt 356—Operations and Systems Management	4

Operations Research Sequence

SysE 347—Industrial Engineering I	4
SysE 348—Industrial Engineering II	4
SysE 315—Dynamic Systems Analysis I	4
SysE 372—Optimization Techniques II	4
SysE 373—Optimization Techniques III	4
Econ 320—Macroeconomic Theory	4

Urban Systems Engineering Sequence

SysE 336—Urban Systems II		4
SysE 337—Urban Transportation Models		4
SysE 338—Urban Transportation Systems Planning	4	
or		4
EnrE 261—Environmental Systems Engineering	4	
Econ 321—Macroeconomic Theory		4
QM 370—Multivariate Analysis		4
QM 371—Survey Research		4

Thermomechanics and Energy Conversion *(Bachelor of Science in Engineering)*

The common core taken by all engineering students is extended in this area of concentration to include further work on heat transfer and the thermodynamics of power systems. Two optional paths are provided, one with a mechanical emphasis and the other with an electrical emphasis.

A graduate from the mechanical option is prepared for a career in those industries or research establishments concerned with power devices, such as turbines, internal combustion engines, reactors, or solar energy equipment. He may also pursue areas involving heat transfer and combustion or heating and refrigeration.

The electrical option includes courses in electromagnetic fields, circuits, and thermodynamics which provide a background for courses in discrete devices (motors), continuous devices (magnetohydrodynamic generators), and novel or direct-energy conversion devices (thermionic convertors, fuel cells). An understanding of physical processes is emphasized. Engineers with this background are required in the electric power industry and in the development of new power systems, high-speed transportation, pollution control, urban engineering, and improved automobile-propulsion systems.

Courses Required for Both Options — *Quarter Hours*

EnrE 202—Intermediate Thermodynamics	4
EnrE 203—Thermodynamics of Power Systems	4
EnrE 214—Viscous Fluid Mechanics	4
EnrE 221—Heat Transfer	4

Mechanical Option

EnrE 213—Compressible Fluid Flow	4
EnrE 241—Experimental Methods in Solid and Fluid Mechanics	4
EnrE 251—Introducation to Electromechanicsl Devices	4
EnrE 321—Intermediate Heat Transfer	4

Electrical Option

EnrE 351—Electromechanical Energy Conversion I	4
EnrE 353—Direct Energy Conversion	4
InfE 212—Signal Processing	4
InfE 219—Introduction to Electromagnetic Fields	4

Electives

Eight hours are required from the following list or from courses in the alternate option (the electrical option may not elect EnrE 251):

EnrE 261—Study of Environmental Engineering Systems	4	
EnrE 304—Transport Phenomena	4	
EnrE 305—Statistical Thermodynamics	4	
EnrE 314—Propulsion	4	
EnrE 325—Combustion	4	
ErnE 352—Electromechanical Energy Conversion II	4	8
InfE 221—Introductory Electromagnetic Field Theory	4	
InfE 311—Linear Systems Analysis	4	
InfE 320—Introductory Wave Propagation and Transmission	4	
MatE 208—Mechanical Vibrations	4	
Math 321—Differential Equations	3	

The College of Liberal Arts and Sciences

Dean B. Doner, Ph.D., Dean of the College
Robert E. Corley, Ph.D., Associate Dean
Richard M. Johnson, Ph.D., Associate Dean
Ellis B. Little, Ed.D., Associate Dean
Wade A. Freeman, Ph.D., Assistant Dean
Allen H. Howard, Ph.D., Assistant Dean
Patricia A. McFate, Ph.D., Assistant Dean
Barbara G. Mittman, Ph.D., Assistant Dean

In the various departments and curricula the College of Liberal Arts and Sciences offers a wide variety of majors in the humanities, the natural and physical sciences, and the social and behavioral sciences. In addition, the College offers preprofessional programs.

Principally, the College provides its students with varied opportunities to broaden their education within the tradition of the liberal arts. The goal of the College requirements is to enable students to become familiar with the heritage of English language and literature and with a foreign language; to develop appreciation for the scientific approach and the methodology of science, mathematics, or logic; and to become acquainted with the growing study of man in his social and behavioral patterns. The purpose of this broad and liberal course of study is to strengthen each student's major program so that when he is graduated, he will have a better understanding of himself and of the development of human society and thought.

Curricula Offered by the College

The College curricula permit students to broaden their knowledge through general education and through concentration within an academic discipline or a specialized program.

Until the student declares a field of specialization (the major) or is accepted into a specialized program, he enrolls in the general curriculum of the College and receives academic advising by the College Office, which

provides information about University and College degree requirements and advises the student in his selection of a field of specialization (his major).

Arts and Sciences Curricula

These curricula lead to the *Bachelor of Arts in Liberal Arts and Sciences* or to the *Bachelor of Science in Liberal Arts and Sciences.* The student chooses a field of specialization (a major) from the following academic disciplines:

Anthropology
Biological Sciences
Black Studies
Chemistry
Classics
Criminal Justice
Criminalistics
Economics
English
French
Geography
Geological Sciences
German
History
Judaic Studies
Latin American Studies
Mathematics
Music
Philosophy
Physics
Political Science
Psychology
Slavic Languages and Literatures
Sociology
Spanish
Speech and Theater

Specialized Curricula

These curricula lead to the Bachelor of Arts or Bachelor of Sciences *in the field of specialization:*

Chemistry*
Mathematics and Computer Science
Physics*
Teacher Education

*These curricula provide more specialized training in chemistry and physics than do the arts and sciences curricula in these fields.

Teacher Education Curricula[1]

Students who are preparing for certification in secondary school teaching enroll in curricula supervised by the departments offering the various majors. These programs, which differ in some respect from those of the arts and sciences curricula, lead to a baccalaureate that prepares the student for certification to teach one of the following subjects in a secondary school:

[1]For further information on secondary school teaching preparation, see the College of Education section of this catalog.

Biological Sciences	History
Chemistry	Mathematics
Earth Sciences	Physics
English	Russian
French	Sociology
Geography	Spanish
German	Speech and Theater

To register in a teacher education curriculum a student must have a minimum grade-point average of 3.500 at the end of the sophomore year. The teacher education student must meet all University and College requirements for graduation. Specific requirements for teacher education majors and minors can be found in the departmental listings.[1] In addition to these requirements, all students in all teacher education curricula must complete the following courses:

Psychology 100—Introduction to Psychology I
Political Science 151—American Government: Organization and Powers
Education 170—Educational Foundations
Education 210—The Educative Process
Education 230—Curriculum and Instruction in the Secondary School
Education 250—Educational Evaluation
Education 270—Educational Practice with Seminar I
Education 271—Educational Practice with Seminar II

[1]For information on alternative means of certification, see *The Council on Teacher Education.*

Preprofessional Curricula

The preprofessional curricula provide course work for students who intend to pursue their undergraduate or graduate training in a professional school. Prelaw and premedicine students may earn a degree in the College of Liberal Arts and Sciences. Other preprofessional programs lead to a degree awarded not by the College of Liberal Arts and Sciences but by the appropriate professional college. Therefore, it is important that the student familiarize himself with the specific requirements of the professional school. Students may register for preprofessional work in one of the following areas:

Medical Dietetics	Prelaw[2]
Medical Laboratory Sciences	Premedicine[3]
Medical Record Administration	Prenursing
Occupational Therapy	Prepharmacy
Physical Therapy	Preveterinary Medicine
Predentistry	

[2]The College of Law of the University of Illinois at Urbana-Champaign requires a degree from an approved undergraduate college; this requirement may be waived by special action. For further information, consult the Office of the Dean of the College of Law at Urbana. Some colleges of law admit students who have completed three years of college work. Prelaw students should consult the office of the dean of law of the college in which enrollment is contemplated for further information about admissions policies.

[3]The premedicine curriculum is a four-year program leading to a bachelor's degree. Students who enroll in this program choose a field of specialization and complete the usual graduation requirements of the College of Liberal Arts and Sciences.

Graduation Requirements

The College of Liberal Arts and Sciences requires a minimum of 180 hours of credit for the bachelor's degree. These hours include credit received in required courses in English Composition but exclude credit in basic military science and in the formerly required courses in physical education. A student must complete either the first 135 or the last 45 hours offered for the degree in uninterrupted residence at Chicago Circle. Work taken at the University of Illinois at Urbana-Champaign does *not* satisfy this requirement. Credit earned through proficiency examinations cannot be applied toward the minimum 45-hour residence requirement.[1] Study abroad and study off campus that have been approved by the student's major department and by the College are not considered an interruption of residence for students in the College of Liberal Arts and Sciences. The University also requires that at least 90 of the quarter hours offered for the degree must be earned at Chicago Circle or at another accredited four-year institution after junior standing has been attained.

A student is responsible for meeting the graduation requirements of the University and College and those of his major or curriculum that are in effect at the time of his initial registration in each. If requirements are changed, a student may elect to fulfill the new requirements or he may continue to meet those that were in effect at the time of his initial registration. If courses originally required are no longer offered, the College has the prerogative of specifying acceptable substitutes.

In addition to the requirements stated above, the College of Liberal Arts and Sciences has requirements in each of the following: advanced hours and foreign language and course-distribution requirements in the humanities, the social sciences, the natural sciences and the field of specialization (the major).

[1]See Proficiency Examinations.

Advanced Hours Requirement. Of the 180 hours that a student is required to earn for a degree in the College of Liberal Arts and Sciences at least 45 hours must be in 200-level or 300-level courses taken after a student has earned 90 or more hours.

Foreign Language Requirement. The basic requirement is a reading knowledge, at a level of proficiency equivalent to that which would result from elementary and intermediate language study (the first two years) at the University of Illinois at Chicago Circle, of any language that has a recognized literature. The requirement may be fulfilled by presenting four years of high school credit in a single foreign language, by completing a full sequence of language courses (see *Courses of Instruction* for the offerings of the language departments), by taking a partial sequence determined by the results of a placement test, or by passing a proficiency examination written by arrangement with the appropriate language department. Students whose performance on the placement test indicates assignment to a more advanced course than would normally be expected may receive some college credit. The

College currently offers 24-hours sequences in Chinese, French, German, classical Greek, Hebrew, Italian, Latin, Lithuanian, Polish, Portuguese, Russian, Spanish, and Swahili. If a student wishes to be examined for proficiency in any other language, the College will attempt to make special arrangements for such an examination and will make every effort to assure that the examination be administered on the Chicago Circle campus. The following rules apply to the foreign language requirement for graduation for those students who have not presented four years of high school credit in a single foreign language.

1. For the student who wishes to satisfy the language requirement by continuing to study a language begun in high school, the results of the placement test will determine the level at which he will continue his language study on the college level. For example, the student who places in the equivalent of a 101 course will enroll in that course but will receive credit for it only if he presents *no more than two years* of high school credit in that language; the student who places in the equivalent of a 102 course will enroll in that course but will receive credit for it only if he presents *no more than three years* of high school credit in that language. A student who wishes to repeat an introductory language course taken elsewhere (for which he will not receive credit) may register for such a course only with the consent of both the particular language department and the College Office.

2. A transfer student with credit for two years of a language satisfies the College language requirement. A transfer student with some language study who has not yet completed the language requirement *must* take a placement test if he plans to continue study in that language. If the placement test so indicates, he may register for a course that duplicates previous college credit; in that case, by University rule, the previous credit is forfeited.

3. The student who begins his language study at Chicago Circle and the student who transfers to the University with fewer than 45 hours of credit should complete the foreign language requirement by the end of the junior year. The transfer student admitted with 45 or more hours of credit registers for a foreign language course every quarter until the language requirement have been satisfied. A transfer student admitted with 135 hours who has not yet satisfied the language requirement may do so by passing a course in the same language during each quarter he is in residence.

Course Distribution Requirements introduce the student to three areas of knowledge—the humanities, the social sciences, and the natural sciences. In the College of Liberal Arts and Sciences the student must have 12 quarter hours of credit in humanities, 12 in social sciences, and 20 in natural sciences. Although some departments offer course work that satisfies the requirement in more than one area, a student may use course work in a given department to fulfill the requirement in only one of the three areas. A maximum of 12 hours in the student's major department applies toward course-distribution

credit. Transfer students will receive course-distribution credit for equivalent courses taken elsewhere. If a transfer student has not completed the equivalent of all the College's course-distribution requirements elsewhere, he is required to fulfill the remainder at Chicago Circle.

A wide variety of courses in the College of Liberal Arts and Sciences carry course-distribution credit for students in the College; some courses in the College of Architecture and Art and in the College of Business Administration also carry course-distribution credit for students in the College of Liberal Arts and Sciences. Following are the courses that carry course-distribution credit for College of Liberal Arts and Sciences students.

Courses Fulfilling Humanities, Social Sciences, and Natural Sciences Requirements

Humanities—12 quarter hours

Black Studies: 170; 257-259, 286, 287; 370, 379.
Classics: All courses in translation.
English: All courses.
French: 161-163, 184, 186; all 200-level courses except 211-213, 221, 222, 281; all 300-level courses except 381 and 382.
German: 185, 190, 191, 192, 195, 196; all 200-level courses except 201-207, 230, 240, 250, 251, 270, 271; all 300-level courses except 320, 321, 385.
Greek: All courses above the 100 level.
Hebrew: All courses above the 100 level.
History: All courses except 151; 251-253; 351-354, 386, 388, 389.
History of Architecture and Art: All 100-level courses; all 200-level courses.
Humanities: All courses.
Italian: All courses except 100-103.
Judaic Studies: All courses.
Latin: All courses above the 100 level.
Latin American Studies: 161, 170, 171, 187; 223, 224, 232, 242, 250, 261-269; 308-311, 323, 324, 361.
Music: 100, 130, 131; 214-220, 230-232, 240-242, 288, 289; 330.
Philosophy: All courses except 200; no more than one course in logic may be offered.
Polish: All courses above the 100 level.
Portuguese: All courses except 101-103.
Religious Studies: 214, 221-223, 235, 248, 272-274, 282; 306, 313, 395.
Russian: All courses above the 100 level except 204, 207, 332.
Spanish: All courses except 101-103.
Speech and Theater: 121-123, 141; 241; 321, 322, 324, 325, 328, 329.

Social Sciences—12 quarter hours

Anthropology: All courses.
Black Studies: 165, 189, 181; 225; 306, 386.
Criminal Justice: All courses.
Economics: All courses.
Finance: 340.
Geography: 110-169, 190, 197; 208, 210-269.
History: 151; 251-253; 351-354, 386, 388, 389.
Latin American Studies: 165; 212, 213, 252-255, 280, 282; 334, 354, 381.
Political Science: All 100-level courses; all 200-level courses except 250, 251, 299.
Psychology: All courses.

Religious Studies: 225, 246; 312, 315.
Sociology: All 100-level courses except 185; all 200-level courses except 262, 263, 287, 288, 299.
Speech and Theater: 100-102, 107, 111-113, 131, 171, 180, 181; 201, 202, 211-213, 231-233, 239; 301-303, 311-313, 315, 331, 333, 351, 354.

Natural Sciences—20 quarter hours
Biological Sciences: All courses.
Chemistry: All courses except 110, 111, 132.
Geology: All courses.
Mathematics: All courses except 100, 101, 104-108, 170-172.
Natural Sciences: All courses.
Physics: All courses.

Note: Courses used to fulfill the language requirement may not also be offered to meet the humanities requirement.
Course work in one department may not be used to fulfill requirements in more than one of the three areas.

Field of Specialization (the Major)

All students are expected to select a major before the junior year. However, the student may, in some instances, select a field of specialization (his major) upon admission to the University or at any time during his freshman year.

Requirements for the various majors are stated in the department listings that follow. At least 20 hours of the major requirements must be taken in upper-division courses; 12 of these hours must be taken while the student is in residence. A minimum grade-point average of 3.000 is required in the major field.

A student may declare a second field of specialization (a double major) by indicating his intention to the College Office and to his adviser in the primary field of specialization. He will then pursue course work for each of his fields according to the requirements of each department. Cross-listed courses may serve both fields. A student need not repeat work or duplicate requirements to complete the second field of specialization.

The Minor

Students who entered the College or declared a field of specialization after September 1, 1969, are not required to elect a minor; however, a student who so desires may graduate with a minor field of specialization. At least 12 hours must be at the 200 or 300 level, *except those in a foreign language,* where 8 hours must be at the 200 or 300 level. Requirements for the minor are stated in the department listings. When a student elects a minor field of specialization, the program of study in that field must be developed with and approved by an adviser in the department of the minor field of specialization. The department in which the student chooses a minor field may specify that at least 8 advanced hours must be taken in residence. A minimum grade-point average of 3.000 is required in the minor field.

The minor may be chosen from the following fields of specialization.

Anthropology
Biological Sciences
Black Studies
Chemistry
Criminal Justice
Economics
English
French
Geological Sciences
Geography
German
Greek
History
Italian
Judaic Studies
Latin
Latin American Studies
Lithuanian
Mathematics
Music
Philosophy
Physics
Political Science
Portuguese
Psychology
Religious Studies
Slavic Languages and Literatures
Sociology
Spanish
Speech and Theater

Graduation With Honors

To be eligible to graduate with *General College Honors* a student must meet one of the following conditions:

1. A minimum grade-point average of 4.500 for the last two years (at least 72 hours) in all academic work completed at the University of Illinois at Chicago Circle and counted toward the degree.
2. For students whose work has been entirely in residence at Chicago Circle, a minimum grade-point average of at least 4.000 in *all* work completed and counted toward the degree.
3. For students whose work has not been taken entirely in residence, a 4.000 average in all academic work completed at the University of Illinois at Chicago Circle (at least 45 hours) and counted toward the degree, both at the University of Illinois at Chicago Circle and elsewhere.

See department listings for the requirements for graduation with *departmental honors (Departmental Distinction).*

The Dean's List

Superior academic achievement in the College of Liberal Arts and Sciences is recognized by placement of the student's name on the Dean's List. Nomination is based on a 4.500 quarter average with a 12-hour minimum course load (exclusive of basic military science and formerly required physical education), 8 hours of which must be for letter grades, and a grade of *pass* for any course taken on a *pass-fail* basis.

Full-Time Program

A full-time program is 12 hours. A program of more than 21 hours must be approved by one of the deans of the College.

Dropping A Course

The current rule for dropping courses is under review by the College. Consult the College Office for the most recent regulation.

Certification of Irregular Students

An irregular student is one who holds a bachelor's degree from a recognized institution of higher learning. For admission procedures see p. 33.

The College does not award a second bachelor's degree; however, upon request, the Dean of the College will issue a letter of certification to an irregular student who has completed departmental requirements for a minor in the College.

Student Options

The College offers a range of opportunities for students to pursue individualized courses of study:

Independent Study. A number of departments offer courses titled *Independent Study* or *Independent Research* in which the student may pursue his own special interests. He may offer toward the degree as many as 32 hours of credit in independent-study courses.

Foreign Study Programs. The University offers foreign study opportunities in France, Spain, and Austria as well as the possibility of independent study abroad. For details see page 24.

Credit for Courses Taken Outside the College. With the exception of a student who is enrolled in a teacher education curriculum or is majoring or minoring in economics, a student may offer for graduation credit as many as 48 hours in courses not included in liberal arts and sciences curricula. The first 12 hours of such work must be approved by the College Office and the balance, up to the 48 hour maximum, by the student's major department. A student enrolled in a teacher education curriculum may offer as many as 48 hours of such courses in addition to required education courses; a student majoring or minoring in economics may offer as many as 48 hours of such courses in addition to economics courses.

Graduate Courses. A student may enroll in a course in the Graduate College (400 level) for undergraduate credit with the permission of the appropriate department.

Student-Initiated Courses. Some departments permit students to initiate courses for inclusion in the regular department offerings. Students are encouraged by those departments to originate courses of their own design. For information contact the department office.

Proficiency Examinations. A student may take a proficiency examination in any subject offered in the College of Liberal Arts and Sciences provided he meets the eligibility requirements stated in this catalog. See page 22. Questions concerning proficiency credit for courses not offered should be directed to the College Office.

Pass-Fail Grade Option. A system of pass-fail grading for the College of Liberal Arts and Sciences has been approved for a trial period in the hope that students would be encouraged to explore areas of interest that they might otherwise avoid because of the possibility of low grades and in anticipation that some of the anxieties of adjustment and grade competition would be reduced.

Students in the College of Liberal Arts and Sciences may take one course each quarter under the pass-fail grade option, which is available to all Liberal Arts and Sciences students who are registered for a full-time program and are in good academic standing. Any Liberal Arts and Sciences course except those required by a student's major department may be taken under the pass-fail option. Courses taken on this basis carry full credit toward graduation requirements, but do not affect a student's grade point average. A maximum of 12 courses to be counted toward a degree, but no more than two courses in a discipline, may be taken under this option.

Instructions and forms for electing the pass-fail option are available in the first floor lobby of University Hall during the first two weeks of each quarter. The forms must be returned by the end of the tenth day of instruction.

Anthropology

Robert L. Hall, Ph.D., Chairman of the Department

Professors: Pedro Armillas, B.S.; Laura A. Bohannan, Ph.D.; Charles A. Reed, Ph.D.

Associate Professors: Susan T. Freeman, Ph.D.; Merwyn S. Garbarino, Ph.D.; Robert L. Hall, Ph.D.; Paul Hockings, Ph.D.; Jack H. Prost, Ph.D.; Sylvia J. Vatuk, Ph.D.

Assistant Professors: Elizabeth A. Brandt, Ph.D.; James L. Phillips, Ph.D.; Stephen L. Schensul, Ph.D.; Charles P. Warren, M.A.

Instructors: Waud H. Kracke, M.A.; Emile M. Schepers, M.A.

Major—for the Bachelor of Arts, 52 hours, distributed as follows:
Anthropology 130, 150, 160, 200, 213, 231, 245, 280, and 12 hours of courses in anthropology at the 200 level or above, and 8 hours of courses at the 300 level.

A major interested in a subdivision of anthropology (social, physical, archeological, or linguistic) must arrange a suitable program of electives with his adviser. Each major is assigned a department adviser.

Departmental Distinction: A candidate must be eligible for College Honors, meet all the requirements for a major in anthropology, and satisfactorily complete a thesis in Anthropology 299. A student who elects a minor in anthropology may also, with the consent of the department, be awarded distinction upon satisfactory completion of Anthropology 299.

Minor— Students from other departments who wish to minor in anthropology must take Anthropology 130, 150, 160, and 20 hours of courses in anthropology at the 200 level or above, chosen in consultation with an adviser assigned by the Department of Anthropology.

Biological Sciences

Professors: Elmer B. Hadley, Ph.D., Head of the Department; Benjamin G. Bouck, Ph.D.; Donald A. Eggert, Ph.D., Sidney F. Glassman, Ph.D.; Douglas Grahn, Ph.D. (Adjunct); Bernard Greenberg, Ph.D.; Arnold B. Grobman, Ph.D.; Helene N. Guttman, Ph.D.; Marion T. Hall, Ph.D. (Adjunct); Robert F. Inger, Ph.D. (Adjunct); Bernard N. Jaroslow, Ph.D. (Adjunct); Jerry R. Kline, Ph.D. (Adjunct); Herbert E. Kubitschek, Ph.D. (Adjunct); Ellis B. Little, Ed.D.; Kenneth Madison, Ph.D.; Carl Peraino, Ph.D. (Adjunct); Albert S. Rouffa, Ph.D.; William Sangster, Ph.D.; Fritz Schlenk, Ph.D. (Adjunct); Max C. Shank, Ph.D.; Stanley K. Shapiro, Ph.D.; Warren K. Sinclair, Ph.D. (Adjunct); Rolf Singer, Ph.D. (Visiting); Eliot B. Spiess, Ph.D.; John F. Thomson, Ph.D. (Adjunct).

Associate Professors: Louise E. Anderson, Ph.D.; David Bardack, Ph.D.; James A. Bond, Ph.D., Howard E. Buhse, Jr., Ph.D.; Michael R. Cummings, Ph.D.; M.A.Q. Khan, Ph.D.; David B. Mertz, Ph.D.; Darrel L. Murray, Ph.D.; John A. Nicolette, Ph.D.; Halina J. Presley, Ph.D.; Jack H. Prost, Ph.D.; David Shomay, Ph.D.; Charles N. Spirakis, Ph.D.; Robert B. Willey, Ph.D.; Ruth L. Willey, Ph.D.

Assistant Professors: Shepley S.C. Chen, Ph.D.; Merrill L. Gassman, Ph.D.; Manuel Goldman, Ph.D.; John Lussenhop, Ph.D.; William Mego, Ph.D.; Dallice Mills, Ph.D.; David G. Penney, Ph.D.; Spencer A. Tomb, Ph.D.; Heman Witmer, Ph.D.

Instructors: Rosemary A. Marone, B.S.; Paul J. Taxey, M.A.; Mohammed Younus, M.A.

Research Associates: Maribeth A. Babler, M.S.; Nancy K. Hutson, M.S.; Nirmalendu Maitra, Ph.D.; Mridulika Virmani, Ph.D.

Assistants: Noreen O. Ash, B.S.; Judith A. Beaird, B.S.; Adrienne F. Becker, B.S.; Marvin Bergeson, B.S.; Joan Bieler, B.S.; Irene A. Blekys, B.S.; Suzanne W. Brown, M.S.; David A. Cawthon, B.S.; James A. Christiansen, B.S.; Ralph H. Cornell, B.S.; David Craig, B.S.; Lawrence J. Dziedzic, B.S.; Sylvia M. Feuer, B.S.; Janet T. Forbes, B.S.; Karen R. Frank, B.S.; Kenneth R. Groh, M.S.; Frances E. Hepburn, B.S.; Arthur F. Hirsch, B.S.; Michael A. Hoban, B.S.; Patricia Johnson, B.S.; Joyce J. Jones, B.S.; Hyder Khan, M.S.; Elizabeth H. Kornecki, B.S.; Wayne A. Landerholm,B.S.; Ellen S. Levy, B.S.; Robert Lobes, B.S.; Alan Markezich, B.S.; George Matwyshyn, B.S.; Sr. Joan E. Mehney, M.S.; Calvin T. Meineke, B.S.; Michael A. Millay, M.S.; Bishnupriya Misra, B.S.; Gerard S. Muzyka, B.S.; Sooja C. Nehrlich, B.S.; Marsha Newman, B.S.; Christine J. Nowicki, B.S.; John S. Olsen, B.S.; Katherine Papademas, B.S.; Elaine G. Papagiannes, B.S.; Kyung Eun Park, M.S.; Shinae L. Park, M.S.; Won Mok Park, M.S.; Charles Passo, B.S.; Sharon M. Pendola, B.S.; William Rizzo, B.S.; Robert B. Rosen, B.S.; Janice W. Schumann, B.S.; Ralph M. Sinibaldi, B.S.; Susan J. Stamler, B.S.; Richard H. Stanton, B.S.; June Steinberg, B.S.; Robert Sullivan, B.S.; Daniel Summers, B.S.; Irene W. Tang, M.S.; Susan Teller, B.S.; Bette C. Vidrine, B.S.; Ronald Warfield, B.S.; Marion C. Watt, B.S.; Helen Widzer, B.S.; Marian B. Wilson, M.S.; Joseph York, B.S.; Hui Fang Yu, B.S.

Major—for the Bachelor of Science, 42 hours (including a maximum of 12 hours of 100-level courses), to include each of the following:

General Biology
Biological Sciences 100, 101, 102

Genetics
Biological Sciences 240, 241

Physiological biology, *one* from
Biological Sciences 261, 262, 275, 326-328, 366, or from 370, 371, 372 and 373 (laboratory)

Developmental and structural biology, *one* from
Biological Sciences 230, 232, 250, 280, 281, 282, 283, 304, 309, 313, 325, 333, 356, 384, 385, 388, 389

Ecology and evolutionary biology, *one* from
Biological Sciences 201, 220, 315 and 324 or 380, 318, 319, 320, 345, 395, 397

Additional courses at the 200 level or above, chosen with the consent of an adviser, to bring the total to 42 hours in biological sciences.

Mathematics 100, 101, 130 or 104, 105, 130. Mathematics 104, 105, 130 are recommended for Biological Sciences 240, 241.

Required Prerequisite and Collateral Courses
Chemistry 112, 113, 114 or 115, 116, 117 and 232, 233, 234, 235.
Physics 101, 102, 103 or 111, 112, 113.

Departmental Distinction: Candidates for Departmental Distinction must perform creditably in all required advanced hours. For specific requirements consult the Department at least three quarters prior to planned graduation.

Minor— Students from other departments who wish to minor in biological sciences must take Biological Sciences 100, 101, 102, and 20 hours of courses in biological sciences at the 200 level or above, chosen in consultation with an adviser in the Department of Biological Sciences.

Teacher Education in Biological Sciences: Requirements for Teaching in Secondary Schools

Major:—46 hours, distributed as follows:
Biological Sciences 100, 101, 102
240-241, 261-262
300, 307, 315, 324 or 380, 345
One course from 230, 232, 280, 313, 319, 333, 384, 388, 389
Physics 101, 102, 103 or 111, 112, 113
Chemistry 111 (if needed), 112, 113, 114, 232, 233, 234, 235
Three quarters of mathematics
(Calculus and/or statistics is highly recommended.)
Electives: 6 to 8 hours in biological sciences
(To provide a balance between plant and animal biology.)

Minor—33 hours, distributed as follows:
Biological Sciences 100, 101, 102
21 hours from 200- and 300-level biological sciences courses

Black Studies

Program Coordinator—Grace Holt, Associate Professor of Speech and Theater

Major—for the Bachelor of Arts, 56 hours, distributed as follows:
Black Studies 257, 258, 259
Black Studies 170 and 370
12 hours of Black Studies 298
24 additional hours in Black Studies courses

Related Field—A student majoring in Black Studies must have 28 additional hours of credit in either the social sciences or the humanities, distributed as follows:

Social Sciences Option
4 hours from: Geography 182, History 151, Political Science 120, Political Science 130, Psychology 143, Quantitative Methods 270, Sociology 185, Speech 210
24 hours, of which at least 12 hours must be in one department, in anthropology, criminal justice, economics, political science, psychology, sociology, and speech courses carrying social science course-distribution credit

Humanities Option
8 hours from: History 141, Humanities 289, Philosophy 101, 102, 103
20 hours, of which at least 12 hours must be in one department, in classics, English, foreign language, history, music, philosophy, and speech courses carrying humanities course-distribution credit.

For students majoring in Black Studies, the major and related field will satisfy course-distribution requirements in both the social sciences and the humanities.

Chemistry

Professors: William F. Sager, Ph.D., Head of the Department; Bernard J. Babler, Ph.D., Executive Secretary; Joseph H. Boyer, Ph.D.; Thomas H. Brown, Ph.D.; Richard L. Carlin, Ph.D.; Melvyn R. Churchill, Ph.D.; Ferris B. Crum, Ph.D. (Emeritus); Roy Huitema, Ph.D. (Emeritus); Charles K. Hunt, Ph.D.; Chui Fan Liu, Ph.D.; Clifford N. Matthews, Ph.D.; Robert M. Moriarty, Ph.D.; Jan Rocek. Ph.D.; Robert I. Walter, Ph.D.

Associate Professors: Ronald J. Baumgarten, Ph.D.; Richard Burns, Ph.D.; Anatol Gottlieb, T.Sc.D.; Cynthia A. Jameson, Ph.D.; Jacques Kagan, Ph.D.; John H. Kiefer, Ph.D.; Rosalind A. Klaas, Ph.D.; Victor J. Mansfield, Ph.D.; William L. Mock, Ph.D.; Hans T. Mueller, Ph.D. (Emeritus); Samuel Schrage, Ph.D.

Assistant Professors: Benedict W. Bangerter, Ph.D.; John W. Cowin, M.S. (Emeritus); Anthony H. Francis, Ph.D.; Wade A. Freeman, Ph.D.; Eric A. Gislason, Ph.D.; David G. Gorenstein, Ph.D.; Richard Kassner, Ph.D.; Florence Klee, Ph.D.; Leonard Kotin, Ph.D.; Harvey Z. Kriloff, Ph.D.; Thomas A. Lothian, M.A.; James N. McElearney, Ph.D.; Ralph E. Meints, Ph.D.; Gerard J. Mikol, Ph.D.; Robert D. Minard, Ph.D.; Edward G. Rietz, Ph.D.; George I. Sackheim, M.S.; Robert N. Schwartz, Ph.D.; John F. Steiner, Ph.D.; Milton Yusem, Ph.D.

Instructors: Shafeek Farag, M.A.; Elaine Z. Herzog, M.S.; James K. Luurs, M.S.; Clarence J. Perry, M.Ed. (Emeritus); Eva Rocek, Ph.D.; Edward S. Sachs, M.S.; Michael G. Savoy, M.S.; Frances K. Seabright, M.S.

Assistants: Dalmacio A. Agdeppa, Jr., M.S.; Amir Mir Ali, M.S.; Dorothy C. Barron, M.S.; Frank E. Budenholzer, B.S.; Wei-yang Chang, M.S.; Yue-guey Chang, M.S.; Kan-nan Chen, B.S.; Tajan Chiang, B.S.; Chun-cheng Chien, M.S.; Anton Chin, M.S.; Chia-chi Kathy Chu, M.S.; Harriet P. Croke, M.S.; Wesley L. Doak, B.A.; Gwen Dragutinovich, B.S.; Jonathan E. Dunn, B.S.; Gary R. Dyrkacz, M.S.; Salome Estella, B.S.; Michael Fiechtner, B.A.; Bruce E. Firth, M.S.; Chia-min Fu, M.S.; Peter Pi-cheng Fu, M.S.; Joel J. Galante, B.S.; Mati Gendel, B.S.; Michael Georgakis, M.S.; Willard R. Grabenkort, B.A.; Yoshio Hatano, B.S.; Manfred R. Holzaepfel, B.A.; Susan J. Hunter, B.A.; Andrew D. Jorgenson, B.S.; Moo Jin Jun, M.S.; Krishan L. Kalra, M.S.; Debojyoti Kar, B.S.; Khe Bing Kho, M.S.; Willie Kiang, M.S. Johan J. Kooi, D.Sc.; Ching-cheng Lai, B.S.; Chun Luan Lee, M.S.; Clifford Lee, M.S.; Robert Jan Chuen Lee, B.S.; Helen Lietz, B.A.; Kuo-kuang G. Lin, M.S.; Wu-lang Lin, M.S.; Boon H. Loo, M.S.; Bennett P. Melnick, B.S.; Stanley Merchant, M.S.; John C. Miller, B.A.; Zivile O. Modestas, M.S.; Chiu Scheung Ng, M.S.; Loraine J. Nicholls, M.S.; Charles J. O'Connor, B.S.; Herbert E. Paaren, B.S.; Jayantibhai R. Patel, B.S.; John Patterson, B.A.; Terrence R. Pavis, B.S.; Tzuen-yeuan Peng, B.S.; Dennis Prepejchal, M.S.; Andrew Pudzianowski, B.S.; Cecelia A. Radlowski, B.S.; Richard A. Rosenberg, B.A.; Frank J. Rotella, B.A.; Benjamin P. Ruekberg, M.S.; Judith G. Sachs, B.S.; Anthony J. Spak, Jr., M.S.; Emilio Sturino, B.S.; Francis Thomas, B.A.; Luisito A. Tolentino, M.S.; Pratibha C. Varma, B.S.; Ale V. Vasaitis, B.S.; Gerald Wagner, B.S.; Annie Wu, B.S.; Alice F. Wyrwicz, B.S.; Fang-weng E. Yang, B.S.; William Yang, M.S.; Ei-lan Yeh, M.S.; Makram Zoraikat, M.S.

Graduate Fellows: Alan Attia, B.S.; Veronica Curtis, B.S.

Post-Doctoral Fellows and Research Associates: Barry G. DeBoer, Ph.D.; Fariza Hasan, Ph.D.; David F. Mayers, Ph.D.; Gerald A. Pearson, Ph.D.; K.G. Srinivasan, Ph.D.; George F. Vandegrift, Ph.D.

Major—for the Bachelor of Arts, 54-57 hours, distributed as follows:
Chemistry 112, 113, 114, 121 or 117, 118, 119
232, 233, 234, 235, 236, 237, 282
340, 341, 342, 343, 344, 345 or
380, 382, 383 and 10 additional hours of 300-level courses as the department recommends.

Required Prerequisite and Collateral Courses
Mathematics 104 and 105 (if needed); 130, 131, 132
Physics 111, 112, 113
Chemistry majors are assigned a department adviser.

See also *The Chemistry Curriculum.*

Departmental Distinction: Candidates for departmental distinction must perform creditably in all required advanced hours. For specific requirements consult the executive secretary of the department at least two quarters before graduation.

Minor—Students from other departments who wish to minor in chemistry must take 32 hours of courses, chosen with the consent of an adviser in the Department of Chemistry. The following are recommended:
15 hours in Chemistry 112, 113, 114
17 additional hours, 12 of which must be at the 200 or 300 level

Teacher Education in Chemistry: Requirements for Teaching in Secondary Schools

Major—51 hours, distributed as follows:
Chemistry 112, 113, 114, 121 or
117, 118, 119
232, 233, 234, 235, 236, 285
340, 341, 342, 343, 344, 345 or 380, 382, 383, and 3 hours of 300-level courses

Supporting Courses— 42 hours
Mathematics 130, 131, 132, 133; 104 and 105 if needed
Physics 111, 112, 113
Science *electives* must be chosen in consultation with the adviser.

The Chemistry Curriculum

The Bachelor of Science in chemistry is awarded students who successfully complete 192 hours, exclusive of physical education and basic military science, in this curriculum in the College of Liberal Arts and Sciences. This course of study satisfies all the requirements set by the American Chemical Society for professional accreditation.

Prerequisites for Chemistry 340 must be fulfilled before the fall quarter of the student's junior year.

English Composition 101, 102	8 Hours
German or Russian[1]	0-24
Humanities	12
Social Science	12
Mathematics 130, 131, 132, 133	20
Physics 111, 112, 113	14

[1] The equivalent of two years in a single language at the college level; French may be accepted; consult the Department of Chemistry.

Chemistry 117, 118, 119 or 112, 113, 114, 121 if the department recommends	
232, 233, 234, 235, 236, 237	16
340, 342, 344, 347	16
341, 343, 345	7
314, 315, 321	13
Advanced natural science and/or mathematics electives approved by the adviser	16
Electives	17-41

Classics

Professors: Edwin B. Levine, Ph.D., Head of the Department.

Associate Professors: Theodore J. Tracy, Ph.D.; Elizabeth R. Gebhard, Ph.D.

Assistant Professors: James H. Dee, Ph.D.; Matthew W. Dickie, Ph.D.; Dwora Gilula, M.A.

Instructors: Moshe Bernstein, M.A.; Judith S. Cantor, M.A.; George Hoffman, M.A..

Lecturers: Gregory Elftmann, M.A.; Alexander P. MacGregor, Ph.D.

For the Bachelor of Arts, 36 hours, distributed as follows:

Specialization in Greek
Greek 104, 105, 106 and 24 additional hours in Greek. Greek majors who elect a minor are urged to choose Latin (101-106 inclusive).

Specialization in Latin
36 hours exclusive of Latin 101-106. Latin majors who elect a minor are urged to choose Greek (101-106 inclusive).

Majors in classics are urged to take at least 12 hours of ancient history, with concentration on the Greek and Roman periods.

Teacher Education in Latin: Requirements for Teaching in Secondary Schools

Major—48 hours from Latin 109 or above, including Latin 390

Minor—36 hours
Latin 104, 105, 106 and six courses at the 200 or 300 level

Departmental Distinction: Students who complete the major with a grade-point average of 4.750 in the upper-division undergraduate courses will be recommended for Departmental Honors with Distinction.

Criminal Justice

Professors: James W. Osterburg, M.P.A., Head of the Department; Arthur J. Bilek, M.S.W.; Hans W. Mattick, M.A.; Joseph D. Nicol, M.S.

Associate Professors: James T. Carey, Ph.D.; Bernard Dolnick, M.B.A.; Sidney Hyman, M.A.; Michael D. Maltz, Ph.D. (Visiting); Patrick D. McAnany, J.D.; Marshall Patner, J.D. (Visiting); Stephen A. Schiller, J.D.; John A. Webster, D. Crim.

Assistant Professors: Sidney F. Bosen, Ph.D.; R. Michael Buren, Ph.D.; Larry L. Tifft, Ph.D.

Instructors: Sanford M. Sherizen, M.A.; Dennis C. Sullivan, M.A.

Lecturers: Broderick E. Reischl, M.S.W.

The curriculum is designed for students who are planning a career or graduate study in law enforcement, police administration, criminal law, corrections, probation and parole, criminology, or criminalistics.

The Bachelor of Arts is awarded to students who fulfill the general University and the College of Liberal Arts and Sciences graduation requirements and who successfully complete the curriculum in criminal justice.

Major—40 hours, distributed as follows:
Criminal Justice 101, 102, 205, 206, 230, 351, 352.
12 hours of criminal justice courses at the 200 or 300 level.

Required Prerequisite and Collateral Courses—32 hours distributed as follows:
Sociology 100
28 hours of collateral courses at the 200 level or above and approved by a department adviser. Collateral courses may be selected from any department or program in the University; however, those taken outside the College of Liberal Arts and Sciences are subject to the College rule, which states the maximum number of hours that can be taken outside the College and counted toward a degree.

Departmental Distinction: A candidate must be eligible for college honors and must have a grade-point average of 4.500 in all criminal justice courses including courses that are cross-listed with other departments.

Minor—A student who wishes to minor in criminal justice must complete the following courses:
Criminal Justice 101, 102, 351, and 352
8 hours of criminal justice at the 200 or 300 level, chosen with the consent of the adviser.

Bachelor of Science in Criminalistics

The program is intended for students planning advanced study in criminalistics or a career in federal, state, or local regulatory or crime laboratories. The Bachelor of Science is awarded to students who fulfill the general University and the College of Liberal Arts and Sciences graduation requirements* and complete the criminalistics curriculum.

Major—48 hours, distributed as follows:
Criminal Justice 101, 205, 210, 211, 212, 259, 313, 315, 351, and 352

Prerequisite and collateral courses—55 hours, in specified courses in chemistry, physics, sociology and psychology
Chemistry 112, 113, 114, 121, 232, 233, 235
Sociology 100 and 230 (or CrJ 230)
Physics 101 and 102
Psychology 100

*A student who majors in criminalistics will be considered to have completed the 12 hour course-distribution requirement in social sciences and the 20-hour requirement in natural sciences.

Economics

The degree program in economics is administered by the College of Liberal Arts and Sciences. Its faculty are in the College of Business Administration.

Professors: George Rosen, Ph.D., Head of the Department; William Grampp, Ph.D.; Richard F. Kosobud, Ph.D.; Oscar Miller, M.A.

Associate Professors: Eliezer B. Ayal, Ph.D.; Bert Elwert, Ph.D.; Allen Sinai, Ph.D.

Assistant Professors: Robert D. Auerbach, Ph.D.; Donald E. Baer, Ph.D.; H. Woods Bowman, Ph.D.; Frances V. Flanagan, Ph.D.; Winifred B. Geldard, M.B.A., C.P.A. (Emerita); Kurt F. Hausafus, Ph.D.; Mildred Levy, Ph.D.; John F. McDonald, Ph.D.; Ronald P. Moses, Ph.D.; Sol Shalit, Ph.D.; Houston H. Stokes, Ph.D.; Patricia D. Trainer, Ph.D. (Visiting).

Major—For the Bachelor of Arts in Liberal Arts and Sciences, 36 hours, including
Economics 120, 121, 320, 321
Finance 340
16 additional hours at the 300 level

Required Prerequisite and Collateral Courses—23 hours, including
Mathematics 110, 111, 112
Quantitative Methods, 270, 271, 272

Minor—Students from other departments who wish to minor in economics must take at least 20 hours of course work, including Economics 120 and 121, at least *one* of Economics 320, 321 or Finance 340, and one additional 300-level economics course.

English

Professors: Jay A. Levine, Ph.D., Head of the Department; Paul D. Carroll, M.A.; John A. Conley, Ph.D.; Dean B. Doner, Ph.D.; John E. Hardy, Ph.D.; Daryl Hine, Ph.D. (Visiting); Falk S. Johnson, Ph.D.; John C. Johnson, Ph.D.; Alexander Karanikas, Ph.D.; Bernard R. Kogan, Ph.D.; Robie M. Macauley, M.A. (Visiting); Louis Marder, Ph.D.; Ralph J. Mills, Jr., Ph.D.; John F. Nims, Ph.D.; Robert B. Ogle, Ph.D.; Andrew Schiller, Ph.D.; John B. Shipley, Ph.D.; James B. Stronks, Ph.D.; Eugene B. Vest, Ph.D.; Samuel A. Weiss, Ph.D.; Maurita Willett, Ph.D.; M.L. Wine, Ph.D.; Elizabeth V. Wright, Ph.D. (Emerita).

Associate Professors: Irving D. Blum, Ph.D.; Beverly Fields, Ph.D.; Gloria G. Fromm, Ph.D.; Moreen C. Jordan, Ph.D.; Howard H. Kerr, Ph.D.; Robert J. Kispert, Ph.D.; Zelma B. Leonhard, Ph.D. (Emerita); Michael J. Lieb, Ph.D.; Daniel A. Lindley, Jr., Ph.D.; W. Nell Love, Ph.D.; John H. Mackin, Ph.D.; Adam Makkai, Ph.D.; Valerie B. Makkai, Ph.D.; Patricia A. McFate, Ph.D.; Irving M. Miller, Ph.D.; Margaret N. Oleksy, M.A. (Emerita); A. LaVonne Ruoff, Ph.D.; Jaroslav Schejbal, Ph.D.; Mary Thale, Ph.D.

Assistant Professors: Preston M. Browning, Ph.D.; Kathryn H. Carlson, M.A.; Nancy R. Cirillo, Ph.D.; William V. Davis, Ph.D.; Judith K. Gardiner, Ph.D.; Allen D. Goldhamer, Ph.D.; Susan D. Gubar, Ph.D.; Willene S. Hardy, Ph.D.; Eleanor K. Harris, M.A.; Edith Hartnett, Ph.D.; Dale S. Herron, Ph.D.; Brian Higgins, Ph.D.; T.R. Howlett, Ph.D.; Willis C. Jackman, M.A. (Emeritus); Regina M. Janes, Ph.D.; Gary Kirby, Ph.D.; Laurette A. Kirstein, M.A.; Josephine M. Knopp, Ph.D.; Delores Lipscomb, M.A.; Kenneth M. Mason, Jr., Ph.D.; Ronald J. McCaig, M.A. (Emeritus); Jane D. Novak, Ph.D.; Joan G. Reiter, Ph.D.; Hopewell S. Rosch, Ph.D.; Gene W. Ruoff, Ph.D.; John S. Scott, Ph.D.; Leah Sinanoglou, Ph.D.; James P. Sloan, B.A. (Visiting); Gerald C. Sorensen, Ph.D.; Morris Star, Ph.D.; Frederick C. Stern, Ph.D.; William H. Sullivan, Ph.D.; Dorothy E. Welker, Ph.D.; Samuel S. Westgate, Ph.D.; Dale E. Woolley, Ph.D.; Judith F. Wynne, Ed.D.

Instructors: Michael A. Anania, B.A.; John B. Bell, M.A.; Julian W. Breslow, M.A.; Rolf H. Charlston, M.A.; F. Gaylord Cox, M.A.; Russell E. Davis, M.A.; Aletta M. Dreller, M.A.; Mary D. Ellickson, M.A.; Maureen A. Fay, M.A.; Roslyn J. Friedman, M.S.; Louise Glickman, M.A.; Arthur L. Greenwald, M.A.; Robert C. Gruen, M.A.; Lucy Hegie, M.A. (Emerita); Philip G. Heim, M.A.; John R. Holt, M.A.; S. Clark Hulse, M.A.; Judith Isaac, M.A.; John C. Jacobs, M.S.; Michael D. Johnson, M.A.; Wayne A. Jones, M.A.; Ethel R. Kaplan, M.A.; George W. Kennedy, M.A.; Dolores L. Keranen, M.A.; Marion S. Kerwick, M.A. (Emerita); Amy H. Lindley, M.A.T.; David D. Marcus, M.A.; Horace C. Merten, M.A. (Emeritus); Anne Phillips, M.A.; Sterling D. Plumpp, B.A.; Carl A. Rapp, M.A.; C. Lynn Ross, M.S.; Cecilia M. Rudin, M.A. (U.R.S. Leave); Margaret Schaefer, M.A.; Mary C. Sidney, M.A.; Beatrice S. Timmis, M.A. (Emerita); Anne L. Spiselman, M.A.; Eugene Wildman, M.A.; Edwin Yontef, M.A.; Nancy S. Zee, M.A.

Lecturers: Johari M. Amini, M.A.; Vincent J. Balleras, Jr., M.A.; Dace I. Baumanis, M.A.; Lawrence J. Bommer, M.A.; Paul Han, M.A.; Jane Jiambalvo, M.A.; Ruta M. Juska, M.A.; Ruth E. Knack, M.A.; Basil E. LaGoudes, M.S.; Joseph F.S. Mabwa, B.A.; Peter Ray, B.A. (Visiting); Joanne F. Seiser, M.A.; Patricia M. Stahl, M.A.; Ellen Van Laningham, M.A. (Visiting); Karen H. Vierneisel, M.A.; Doris H. Welch, M.A. (Visiting).

Major—48 hours exclusive of 100-level courses, in either Option I *or* Option II. All English majors are required to complete English 150-151-152 (in sequence) before undertaking more advanced work; this requirement also applies to transfer students who have not had equivalent courses. Courses in English at the 100-level do not count toward the major in English or in teacher education. Each major is assigned a departmental adviser.

Option I. Recommended for students planning to do graduate work in English or American literature.

Required Courses

	Hours
English 313 or 314, Shakespeare I or II	4
English 240, Introduction to Techniques of Literary Criticism and Scholarship	4
English 260, 261, Survey of American Literature I, II	8

English literature: one 200- or 300-level course in each of the following areas:*	
Before 1500	4
Renaissance through Milton (1500-1660)	4
Restoration—18th Century (1660-1789)	4
19th Century (1789-1900)	4

*No more than 8 hours in the area requirements may be satisfied by taking genre courses in the novel or drama, exclusive of Shakespeare.

Electives

Senior Seminar *or* 300-level major-author or studies course	4
Any three 300-level courses offered by the department	12

Option II. Students electing Option II are strongly urged to develop their programs carefully with their adviser.

Required Courses

	Hours
English 313 or 314, Shakespeare I or II	4
English 240, Introduction to Techniques of Literary Criticism and Scholarship	4
English 260, 261, Survey of American Literature I, II	8

Electives

Senior seminar or 300-level major-author or studies course Any seven 200- or 300-level courses offered by the department	28

Departmental Distinction: Recommendation is based on grades of A or B in English 298, three senior honors seminars, or a cumulative grade-point average of 4.500 in all English, humanities, and English composition courses and on six quarters in residence at the University of Illinois at Chicago Circle. Senior honors seminars are open to students of superior ability and achievement. Admission is by application to and approval of the department.

Freshmen and sophomores who demonstrate superior scholarship may participate, by invitation, in the freshman and sophomore honors program.

Minor—Students from other departments who wish to minor in English must take a minimum of 32 hours, at least 12 of which are in 200- or 300-level courses, which should be selected by the student *and* his adviser for the minor.

Among the courses recommended are the following:

English 240
A three-quarter (12-hour) survey of English or American or World literature: English 150, 151, 152 or 260, 261, 262 or Humanities 270, 271, 272.

Students who have taken one of these sequences to fulfill the College of Liberal Arts and Sciences requirement in the humanities may count these 12 hours toward fulfilling the 32-hour requirement for the minor in English.

The prerequisite for all 300-level courses in the department is 12 hours of English; 150, 151, 152 are recommended.

Teacher Education in English: Requirements for Teaching in Secondary Schools

All teacher education majors are assigned a department adviser.

The sequence English 150, 151, 152 is a prerequisite for all English education majors.

To be recommended for practice teaching (Education 270, 271) the student must have a cumulative grade-point average of 3.750 in English and must obtain the approval of the supervisor of English education. Preference will be given to students planning to do their practice teaching in the city, rather than in surburban schools.

English 280 and a course in the teaching of reading, such as Education 261 or 265, are required by the Chicago Board of Education for prospective teachers in the Chicago school system.

Major—48 hours, distributed as follows:

Required Courses

	Hours
Literature	
English 313 or 314, Shakespeare I or II	4
English 240, Introduction to Techniques of Literary Criticism and Scholarship	4
English 260, 261, Survey of American Literature I and II	8
English literature: one 200- or 300-level course in *two* of the following areas: Chaucer or Milton; Restoration—18th Century (1660-1789); 19th Century—World War I	8
Languages and Linguistics	
English 301	4
English 205 or 385	4
Teaching of English	
English 281	4
English 386	4

Electives

Senior seminar or a 300-level major-author or studies course	4
One 200- or 300-level course in one of the following areas: Modern British; Modern American; World Literature; Humanities	4

French

Professors: William M. Schuyler, Ph.D., Head of the Department; Robert E. Hallowell, Ph.D.; Marie E. Lein, Ph.D.; Charles M. Lombard, Ph.D.

Associate Professors: Priscilla P. Clark, Ph.D.; Kenneth I. Perry, Ph.D.; Franklin P. Sweetser, Ph.D.; Marie-Odile Sweetser, Ph.D.; Dorothy R. Thelander, Ph.D.

Assistant Professors: Dorothy G. Barber, M.A.; Edmund J. Bender, Ph.D.; Peter V. Conroy, Jr., Ph.D.; Sylvia M. Gladish, Ph.D.; Barbara G. Mittman, Ph.D.; June Moravcevich, Ph.D.; Sylvia Patlogan, M.A.; Mary Eloise Ragland, Ph.D.; Clara S. Skogen, M.A.; Yvonne B. Weinstein, *Diplôme d'Etudes Supérieures.*

Instructors: Judith S. Armbruster, M.A.; Janet Eisenberg, M.A.; Douglas E. Johnson, M.A.; Susan A. Kailin, M.A.; Carrie D. Moore, M.A.; Marcelle Sylvan, M.A.; Nancy A. Tomasek, M.A.

Teaching Assistants: Mary Frances Crabtree, B.A.; Gwendolen A. Dempsey, B.A.

Major—for the Bachelor of Arts, a minimum of 54 hours (excluding all 100-level courses) including:

French 201, and *two* from 202, 203, 204, 205	12 hours
211, 212	6
221, 222	6
390	4
French electives	26, of which 16 hours must be at the 300 level.

It is recommended that French majors take one year of English literature and one year of European history.

Related Field—The major may be supplemented with one of three related fields (courses to be chosen with the consent of an adviser):

1. *French Studies*
   32 hours, including:
   Art history
   History of music
   Classics and/or humanities
   History
   Philosophy and/or political science
   English
   Electives

2. *Comparative Literature*
   32 hours, including:
   Classics
   English literature
   German literature
   Spanish literature
   Humanities
   Electives

3. *Foreign Language Studies*—32 hours, with a minimum of 20 hours in a second foreign language and 12 hours of foreign language electives.

Departmental Distinction: Recommendation is based on a 4.500 average in all courses counted for the major.

Minor—A minimum of 20 hours at the 200 level or above, selected with the approval of the Department of French.

Teacher Education in French: Requirements for Teaching in Secondary Schools.

Major—54 hours

French 201 and *two* from 202, 203, 204, 205	12 hours
211, 212	6
221, 222	6
281	3
381, 382	8
French electives	19, of which 12 hours must be at the 300 level.

Minor—30 hours

French 104, 105, 106 (or equivalents)	12 hours
201 and any *two* from 202, 203, 204, 205	12
211, 221	6
212, 222, and 382 are recommended.	

Geography

Clifford E. Tiedemann, Ph.D., Head of the Department

Professors: James M. Blaut, Ph.D.; Alden Cutshall, Ph.D. (Emeritus); Edwin N. Thomas, Ph.D.

Associate Professors: Mary M. Colby, Ph.D. (Emerita); Edwin H. Draine, Ph.D.; Mildred I. Finney, Ph.D.; Gary L. Fowler, Ph.D.; James E. Landing, Ph.D.; David M. Solzman, Ph.D.; Clifford E. Tiedemann, Ph.D.

Assistant Professors: Yehoshua Cohen, Ph.D.; Bruce G. Gladfelter, Ph.D.; Albert J. Larson, Ph.D.; Oyediran O. Ojo, Ph.D.; Siim Soot, Ph.D.

Instructors: Roland C. Holmes, M.A.; Walter F. Wacht, M.A.

Lecturers: Leo F. Cronin, B.A.; Danuta Schneider, M.A.; Clifford A. Van Dyke, B.A.

Assistants: John Chekatis, B.A.; Valentine Rusinskas, B.A.; John Schneider, B.A.; Robert Smith, B.A.

Major—The student who wishes to major in geography must register with the department adviser before he declares his intent to the College of Liberal Arts and Sciences. He will then be assigned a permanent adviser from the Department of Geography faculty. For the Bachelor of Arts, 56 hours, distributed as follows:

Three introductory systematic courses, either
Geography 101, 102, 103 or
Geography 110, 120, 130[1]

[1] If group A is elected for the major, 12 hours of credit must be earned in *one* of the following: anthropology, economics, history, political science, psychology, sociology, speech.

If group B is elected for the major, 12 hours of credit must be earned in either biological sciences or geological sciences; other natural sciences will be accepted only with the approval of the department adviser.

The student must also earn 24 to 36 hours of credit in areas supportive of his area(s) of emphasis. The courses will be selected by the student in consultation with, and the approval of his adviser. A minor in another department may be selected if the adviser approves.

Geography 190 or substitute[1]
One survey course in either urban and settlement geography (Geography 250, 255) or regional geography (Geography 260-268).
Two upper-division systematic sequences.[2]
8 hours in upper-division research methods (geography courses in the 280's or 380's).
One 300-level course in urban geography (Geography 350 or 351) and one in regional geography (Geography 361, 362, or 365).
Geography 391.

Departmental Distinction: Satisfactory performance in Geography 391 and 399 is required for this recognition. In addition, the student must qualify for college honors.

Minor—28 hours. The student who wishes to minor in geography must register with the department adviser. The following courses constitute an acceptable minor in geography:

The three systematic courses of group A or B of the major.
Geography 190 or a substitute[1]
One survey course in either urban and settlement geography (Geography 250 or 255) or regional geography (Geography 260-268).
One upper-division systematic sequence. [2]

Teacher Education Major—The student who elects geography as a major field in teacher education must register with the department teacher education adviser before he declares his intent to the College of Liberal Arts and Sciences. He will then be assigned a permanent adviser from the Department of Geography.

The student who intends to do student teaching under the supervision of the department faculty must indicate this intent in writing to the department teacher education adviser one year prior to the term during which student teaching will take place. For the Bachelor of Science, 48 hours are required, distributed as follows:

Three introductory systematic courses, either group A or B of the geography major[1] and a minimum of two courses beyond those that may have been used as collateral courses with group A or B.
Geography 190 or a substitute[1]
Geography 182 or 185.
Two courses in urban and settlement geography (Geography 250 or 255) or regional geography (Geography 260-268; Geography 260 is required.
Two upper-division systematic sequences.[2]
One 300-level course in regional geography (Geography 361, 362, or 365)

Teacher Education Minor—The student who elects to minor in geography must register with the department teacher education adviser.

An acceptable minor in geography: The three systematic courses of group A or B of the major.
Geography 190 or a substitute.[1]
Two survey courses in regional geography (Geography 260-268), one of which must be Geography 260.
Two upper-division systematic courses. [2]

[1] Geography 190 may be ommitted if credit is earned in any of the following course combinations: Economics 120, 121, History 241, 242, Mathematics 115, 116, Philosophy 101, 150, Quantitative Methods 170, 171, Sociology 100, 185. Four additional hours of geography credit must then be earned at the 300 level to conform to department specifications.

[2] Upper-division systematic sequences consist of the following pairs of courses: Geography 201, 301; 203, 303; 210 and either 310, 311 or 312; 215, 315; 220, 320; 226, 326; either 230, 231 or 233, 330; 235, 335; or similar combinations approved by the department undergraduate adviser.

Geological Sciences

Professors: Werner H. Baur, *Dr. rer. nat.*, Head of the Department; Joseph I. Lipson, Ph.D.; Richard B. McCammon, Ph.D.; Edward J. Olsen, Ph.D. (Adjunct).

Associate Professors: Robert E. DeMar, Ph.D.; Warren C. Forbes, Ph.D.; Kelvin S. Rodolfo, Ph.D.; Norman D. Smith, Ph.D.

Assistant Professors: David W. Baker, Ph.D.; John R. Bolt, Ph.D.; Aijaz A. Khan, Ph.D. (Visiting); A.F. Koster van Groos, Ph.D.; Zubair A. Saleem, Ph.D.

Assistants: W. Owen BeMent, B.S.; Jean E. Bogner, B.S.; Diana L. Duckworth, B.S.; Thomas R. Haglund, B.S.; Stephen K. Kennedy, B.S.; Andrea L. Krivz, B.S.; David T. Long, B.S.; Dennis R. McConnell, B.S.; Lynda M. Riekels, B.S.; Petr Skalnik, B.S.; Joel A. Tassin, B.S.; James J. Vredevoogd, B.S.; William F. Weiner, B.S.; James D. White, B.S.; Gerald M. Wulkowicz, B.S.

Major—For the Bachelor of Science, 46 to 48 hours, distributed as follows:

Geological Sciences 101, 102, 103	15
200, 215, 217	15-17
210 or 218	4
Additional advanced courses chosen with department approval	12

Required Prerequisite and Collateral Courses—50 to 62 hours, including:

Chemistry 112, 113, 114
Mathematics* 130, 131, 132, 133
Physics 101, 102, 103 or, for those students interested in geophysics, geochemistry, and some other areas, 111, 112, 113

***Students who lack appropriate entrance credit must also take Mathematics 104 and 105 and Chemistry 111.**

Departmental Distinction: To be recommended for graduation with departmental distinction in any of the programs of the Department of Geological Sciences a student must have a grade-point average of 4.000 or better (exclusive of military science and physical education) and must perform creditably in Geological Sciences 299.

Minor—Students from other departments who wish to minor in geological sciences must take 27 hours, chosen with the approval of the department. A maximum of 18 hours may be at the 100 level. Geological Sciences 110 is usually required.

Teacher Education in the Earth Sciences: Requirements for Teaching in Secondary Schools

Major—49 to 55 hours, distributed as follows:

Geological Sciences 101, 102, 103
20 hours of advanced courses chosen with the advice of the department.
6 to 12 hours in an approved summer field course.
Geography 102, 103

Supporting Courses—37 to 41 quarter hours, distributed as follows:
Mathematics 130, 131
Physics—3 quarters
Chemistry 112, 113, 114 or the equivalent

Major requirements are somewhat flexible. In certain cases substitutions of courses in physics, chemistry, biology, mathematics, or geography may be made with approval of the department adviser. Geology 110 may be substituted for the summer field course with the consent of the department adviser provided 4 additional hours of advanced geology are taken. Students interested in this major should see an adviser from the Department of Geological Sciences during the first quarter of the freshman year.

German

Professors: Robert R. Heitner, Ph.D., Head of the Department; Lee B. Jennings, Ph.D.; Robert Kauf, Ph.D.; Daniel C. McCluney, Jr., Ph.D.; Leroy R. Shaw, Ph.D.; Elizabeth Teichmann, Ph.D.; Hazel C. Vardaman, Ph.D.

Associate Professors: Arnold J. Hartoch, Ph.D.; Karl F. Otto, Jr., Ph.D.; Ernest S. Willner, Ph.D.

Assistant Professors: Thomas A. Buesch, Ph.D.; Heinz C. Christiansen, Ph.D.; John S. Groseclose, Ph.D.; Rudolf A. Hofmeister, Ph.D.; Edward J. Stone, Ph.D.; Dennis Q. Taylor, Ph.D.; Marilyn Torbruegge, Ph.D.; David M. Weible, Ph.D.

Instructors: Johanna Braunfeld, M.A. (Emerita).

Major—For the Bachelor of Arts, 43 hours in 200-level courses (exclusive of courses given in translation and of German 206, 207, 220, and 240), including:

German 201, 202, 203, 204, 221, 230, 290, 292, 294 and 8 additional hours of 300-level courses (exclusive of 320 and 321)

Note: German 100 through 115, 121 through 126 and 185, 190, 191, 192, 195, 250, 251, 320, 321 are excluded from the major.

Department Honors—Students who complete the major with a grade-point average of 4.600 in the upper division undergraduate courses will be recommended for Departmental Honors with *Distinction*. Departmental Honors with *High* or *Highest Distinction* will be awarded to students who, in addition, meet the requirements of German 298. The designation "High" or "Highest" will be made by the Departmental Honors Committee.

Minor—Students from other departments who wish to minor in German must take a minimum of 19 hours at the 200 level or above, selected with the approval of the Department of German.

Teacher Education in German: Requirements for Teaching in Secondary Schools

Major—48 hours
German 201, 202, 203, 204,
206, 220, 221, 230, 240,
290, 292, 294
4 additional hours selected
from 207 or any 300-level courses

Minor—30 hours
German 104, 105, 106 or
124, 125, 126
201, 202, 203
6 additional hours selected
from 204, 220, 221, 230

Options for satisfaction of the second year of the foreign language requirement:

Regular track: German 104 and any *two* chosen from 105, 106, 107, 108, 109, 110.
Enrichment: Prospective majors and minors are encouraged to take all or part of the two-year sequence 121, 122, 123, 124, 125, 126.

History

Professors: Edward C. Thaden, Ph.D., Chairman of the Department; Shirley A. Bill, Ph.D.; Bentley B. Gilbert, Ph.D.; Louis Gottschalk, Ph.D. (Adjunct); Robert L. Hess, Ph.D.; Peter d'A. Jones, Ph.D.; Stanley Mellon, Ph.D.; Robert L. Nicholson, Ph.D.; Gilbert Osofsky, Ph.D.; Robert V. Remini, Ph.D.; Max Savelle, Ph.D. (Visiting); John B. Wolf, Ph.D.

Associate Professors: Robert Conrad, Ph.D.; James E. Cracraft, Ph.D.; Gerald A. Danzer, Ph.D.; Carolyn A. Edie, Ph.D.; Melvin G. Holli, Ph.D.; George Huppert, Ph.D.; Richard Jensen, Ph.D.; David P. Jordan, Ph.D.; Ronald P. Legon, Ph.D.; Peter R. McKeon, Ph.D.; Richard Millman, Ph.D.; John A. Tedeschi, Ph.D. (Visiting); Louis Unfer, Ph.D. (Emeritus).

Assistant Professors: Burton J. Bledstein, Ph.D.; Larry Danielson, Ph.D.; Arthur Donovan, Ph.D.; Richard Fried, Ph.D.; William A. Hoisington, Ph.D.; Richard J. Levy, Ph.D.; Alasdair Macphail, Ph.D.; Marion S. Miller, Ph.D.; Michael Perman, Ph.D.; Leo Schelbert, Ph.D.

Instructors: Eugene Costa, M.A.; LaRay Denzer, M.A.; Perry R. Duis, M.A.; Herman Ooms, M.A.; Fredrica H. Thompsett, M.A.; J. Mills Thornton, M.A.

Lecturers: Hugo Leaming, B.D. (Visiting); Muriel Moulton, M.A. (Visiting).

Assistants: Paul Barrett, M.A.; Lawrence Baumann, M.A.; Thomas B. Bullard, M.A.; Nazaris DeVine, B.A.; Frances Feinerman, M.A.; Mary Ann Gerber, M.A.; Benjamin Haddox, M.A.; Richard Holbrook, M.A.; Barbara Kehoe, M.A.; Rosemary Keller, M.A.; Andrew Kipta, M.A.; Marla S. Kruglik, M.A.; Gregory Lennes, M.A.; Eileen Mackevich, M.A.; Christine McHugh, M.A.; Elizabeth Moore, M.A.; Anthony Nelson, M.A.; Philip Pizzica, B.A.; Doris Racich, M.A.; Judithrae, E. Ross, M.A.; Barbara Sciacchitano, M.A.; Shael Siegel, M.A.; Muriel B. Stone, B.A.; Zdenko Zlatar, M.A.

Major—For the Bachelor of Arts, 48 hours, distributed as follows:

100-level courses	4-12 hours
200- and 300-level courses, including at least 12 hours of 300-level courses	36-44 hours

Single-field concentration of 12 to 20 hours within the first 48 hours of history is required.
Majors are advised by the director of undergraduate advising and his staff.

Departmental Distinction: a 4.500 all-University average and a 4.750 average in all courses taken in the Department of History at Chicago Circle.

Minor—Students from other departments who wish to minor in history must take at least 24 hours, including 4 hours of 100-level courses and a minimum of 8 hours of 300-level courses.

Teacher Education in History: Requirements for Teaching in Secondary Schools

Major—Requirements are identical with those for the regular Bachelor of Arts in History degree. The Department of History does not require its teacher education majors to offer a minor field.

Judaic Studies

The Bachelor of Arts is awarded to students who fulfill the general University and the College of Liberal Arts and Sciences graduation requirements and successfully complete the curriculum in Judaic Studies. The curriculum affords study in five areas and an option for either a general major or a specialization in Hebrew language and literature.

The major in Judaic Studies is a cooperative program offered by the University in conjunction with the Spertus College of Judaica.

Major—for the Bachelor of Arts, 54 hours exclusive of 100-level courses.

General Major

18 hours in each of three from these five areas: Hebrew language (Hebrew 201-212); Bible (Judaic Studies 220-229); Talmud (Judaic Studies 240-250); history (Judaic Studies 260-281); ethics and thought (Judaic Studies 285-296).

Specialization in Hebrew Language and Literature

36 hours of Hebrew language and literature beyond the 100-level (Hebrew 201-212)

9 hours in each of two from these five areas: Bible (Judaic Studies 220-229); Talmud (Judaic 240-250); history (Judaic Studies 260-281); ethics and thought (Judaic Studies 285-296).

Required Prerequisite Courses:

Hebrew 101-106 or the equivalent.

Minor—Students from other departments who wish to minor in Judaic Studies must take Hebrew 101-106 (or the equivalent) and 9 hours in each of three areas for a total of 27 hours beyond Hebrew 106.

Latin American Studies

Program Coordinator—Hector Hernandez-Nieto, Assistant Professor of Spanish

Major—for the Bachelor of Arts, 48 hours, distributed as follows:
Latin American Studies 261, 262, 263
12 hours from among the following humanities courses: Latin American Studies 161, 170, 171, 187, 222, 223, 224, 232, 233, 264, 265, 266, 267, 268, 308, 309, 310, 311, 323, 324, 361

12 hours from among the following social sciences courses: Latin American Studies 165, 215, 216, 252, 253, 254, 255, 280, 282, 334, 354, 381
Latin American Studies 290
8 additional hours of Latin American Studies courses

Required Prerequisite and Collateral Courses—24-48 hours, distributed as follows:
Spanish 101-106; or Spanish 100, 110, 120; or Portuguese 101-106; or Portuguese 100, 110, 120; or the equivalent
24 hours in a humanities or a social science department

For students majoring in Latin American Studies, the major and required collateral courses will satisfy course distribution requirements in both the social sciences and the humanities.

Mathematics

Professors: Joseph Landin, Ph.D., Head of the Department; Herbert J. Curtis, Ph.D., Executive Secretary; A.O.L. Atkin, Ph.D.; Harold W. Bailey, Ph.D. (Emeritus); Norman Blackburn, Ph.D.; Djairo DeFigueiredo, Ph.D.; Flora Dinkines, Ph.D.; Philip Dwinger, Ph.D.; Irwin K. Feinstein, Ph.D.; Paul Fong, Ph.D.; Evelyn Frank, Ph.D.; Henry L. Garabedian, Ph.D. (Emeritus); Victor K.A.M. Gugenheim, Ph.D.; Norman T. Hamilton, Ph.D.; Alice G. Hart, M.S.; Miles C. Hartley, Ph.D. (Emeritus); Christoph Hering, Ph.D.; Noboru Ito, Ph.D.; Shmuel Kantorovitz, Ph.D.; Marvin I. Knopp, Ph.D.; David A. Page, M.A.; Louis L. Pennisi, Ph.D.; Reuben I. Sandler, Ph.D.; W. Forrest Stinespring, Ph.D.; Victor Twersky, Ph.D.

Associate Professors: Furio Alberti, Ph.D.; Ruth M. Ballard, Ph.D. (Emerita); Eugene M. Barston, Ph.D.; Aldridge K. Bousfield, Ph.D.; Warren H. Brothers, Ph.D.; David Foulser, Ph.D.; Louis I. Gordon, Ph.D.; Brayton I. Gray, Ph.D.; Richard Handelsman, Ph.D.; Morton E. Harris, Ph.D.; Louise Hay, Ph.D.; Melvin L. Heard, Jr., Ph.D.; Roger G. Hill, B.A.; William A. Howard, Ph.D.; James J. Kelleher, Ph.D.; Richard G. Larson, Ph.D.; Sim Lasher, Ph.D.; Sue-Chin Lin, Ph.D.; James W. Moeller, Ph.D.; Kenneth H. Murphy, M.S.; T. Parthasarathy, Ph.D. (Visiting); T.E.S. Raghavan, Ph.D.; G.V. Ramanathan, Ph.D.; Neil W. Rickert, Ph.D.; Robert I. Soare, Ph.D.; Martin C. Tangora, Ph.D.; Avrum I. Weinzweig, Ph.D.

Assistant Professors: Neil E. Berger, Ph.D.; Winifred V. Berglund, M.A.; Bernard M. Berlowitz, Ph.D.; Joel D. Berman, Ph.D.; Raymond T. Czerwinski, Ph.D.; Verena H. Dyson, Ph.D.; Helmut P. Epp, Ph.D.; Gerald L. Gordon. Ph.D.; Robert N. Grannick, Ph.D.; Floyd B. Hanson, Ph.D.; Steven L. Jordan, Ph.D.; Louis H. Kauffman, Ph.D.; Jeffrey S. Leon, Ph.D.; Jeff E. Lewis, Ph.D.; Julia B. Linn, M.S.; Mu-Chou Liu, Ph.D.; Jeanette L. Lumley, M.A.; John M. Masley, Ph.D.; Kenneth W. Newman, Ph.D.; Grace M. Nolan, M.S.; Thomas B. Ondrak, M.S.; Lena C. Pu, Ph.D.; John A. Sanders, Ph.D.; Nicholas C. Scholomiti, M.A.; Helen W. Sears, M.A.; Laurence R. Sjoblom, B.S.; Rose L. Vedral, M.A.; Glenn P. Weller, Ph.D.; Leo F. Ziomek, Ph.D.

Instructors: Kathleen M. Hotton, M.A.; Betty J. Kuzmanic, M.Ed.; Charles E. Olsen, B.S. (Emeritus); Rose L. Shook, M.A. (Emerita).

Lecturers: Marie V. Bousfield, Ph.D.; David C. Feinstein, Ph.D.; C.Y. Ho, M.S.; Marjorie W. McNichols, M.A.; David M. Rocke, M.A.; Marjorie M. Stinespring, Ph.D.

Assistants: Roger Alm, B.S.; Hans Arnold, B.S.; Oscar Barriga, M.S.; Victor Bennison, B.A.; Lawrence Block, B.S.; Duncan Buell, M.S.; Donald Buresh, B.S.; Thomas Callahan,

B.S.; Irene Cechura, B.S.; Li-Nai Chen, B.S.; Ming-Ming Chen, M.S.; Hubert Chin, M.A.; Arunas Dagys, B.S.; George Dassios, M.S.; George Douros, B.S.; Brian Downs, B.S.; William Duffie, M.A.T.; Ronald Gadzinski, B.S.; Anna Galfredi, B.S.; Laurence Gearhart, B.S.; Antanas Gilvydis, M.S.; Christine Gober, B.A.; Sarla Gupta, M.A.; Thomas Hoppens, M.S.; Anthony Hughes, M.S.; Michael Hughes, B.S.; Huey-Lin Hwang, M.A.; Cecilia Klonowski, B.S.; Lawrence Klonowski, M.S.; Marilyn Jansen, B.S.; Anna-Lise Jensen, B.S.; Richard Jenson, B.A.; Shyam Johari, M.S.; Jimmie Johnson, M.S.; Nancy Johnson, M.S.; Catherine Kerkes, B.A.; Constantine Kostakis, M.S.; Donald Lambe, B.S.; Vytautas Laucius, B.S.; Eng Bin Lim, M.S.; Bertrand Lin, M.S.; Bing-Ying Lin, M.S.; Jack Losch, B.A.; Richard Lucas, B.S.; Li-Fan Ma, M.S.; Millicent Marks, B.S.; Geoffrey Mason, M.S.; Patrick McBride, M.S.; George Milauskas, B.S.; Peter Moolenaar, B.S.; Lawrence Moy, B.S.; Seema Munir, B.S.; Bruce Nelson, B.S.; John O'Neal, B.S.; Bababhai Patel, M.S.; Kai-Jaung Pei, M.S.; Cheryl Peterson, B.A.; Isaac Platt, B.S.; Mindaugas Prackaila, B.S.; John Riegsecker, M.S.; Barbara Rowley, B.A.; Frederick Schaedel, B.S.; Craig Smorynski, B.S.; Donald Stachurski, B.S.; Lynnell Stern, B.S.; Alex Thannikkary, M.S.; Frederick Thulin, B.S.; Damber Tomer, M.S.; Marvin Troutt, M.S.; Dennis Wallis, M.S.; Rhonda Weisberg, M.S.; Tomas Weisz, M.S.; Floyd Willmore, M.S.; Gary Woehlke, B.A.; Sheldon Wolfe, B.A.; Rina Wong, M.S.; Roger Wong, B.S.; William Yue, B.S.; Wayne Zage, B.S.; Zisa Zimmerman, B.S.

Major—For the Bachelor of Science, 56 hours, which must include:

Mathematics 130, 131, 132, 133	20 hours
340, 341, 342	9 hours
Three courses from 310, 311, 312, 313, 314, and 315	10 hours

Usually a student will take 310, 311, and 312, or 313, 314, and 315, but other combinations are permissible if a departmental adviser approves.

The remaining hours are to be chosen from mathematics courses numbered 195 or higher with the exception of 300, 301, 302, and 348. Each mathematics major is assigned a departmental adviser and the student's choice of courses must be approved by the adviser.

Transfer Students. For graduation, a transfer student must pass at least 18 hours of 300-level mathematics courses taken at Chicago Circle.

Required Prerequisite and Collateral Courses—A student majoring in mathematics who does not have a minor program approved by another department must take a program of collateral courses. This program should demonstrate the study in some depth of a field which is related to or uses mathematics.

Option I: Physics 111, 112, 113 and 114.
Option II: 24 hours of courses chosen from one or two fields; if two are chosen, a minimum of 8 hours must be taken in each field. Normally, at least one of the fields should be chosen from the natural sciences. Other fields may be elected subject to approval by the departmental adviser.

A student who intends to major in mathematics but lacks the prerequisites to begin with Mathematics 130 may obtain credit for college algebra and trigonometry by taking Mathematics 104 and 105, or 100 and 101 and 105. However, none of these courses may be applied toward the 56 hours of credit required for the degree.

Honors Courses. Honors sections of some courses in mathematics are offered throughout the year. For details see the Timetables. Admission to honors sections is not restricted to mathematics majors, but consent of the department is required.

Departmental Distinction: The student must qualify for college honors and must have done exceptional work in mathematics, as determined by the department. Generally a 4.500 average in all upper division work is required.

Minor—Students from other departments who wish to minor in mathematics must complete Mathematics 130, 131, 132, 133, and 12 hours of mathematics courses at the 200 or 300 level.

Teacher Education in Mathematics: Requirements for Teaching in Secondary Schools

Major—55-57 hours
Mathematics 130, 131, 132, 133
300, 301, 302, 303, 304
305, 307, 310 or 313, 340, 341
342 or 348
Electives: 5-19 hours

Minor—34-36 hours
Mathematics 130, 131, 132, 133
300, 307
301 and 302 or
340 and 303 or
348 and 303

Students in the Teacher Education in Mathematics curriculum must have a cumulative grade-point average in mathematics courses of not less than 3.500 to be recommended for Education 270, Student Teaching. Students are strongly urged to choose electives from areas of study which will support their major programs. The departmental advisers for this curriculum are available to assist the student in the selection of such courses.

Curriculum in Mathematics and Computer Science

Designed for students who seek careers in systems and/or mathematical programming. Students who successfully complete the program are awarded the degree of Bachelor of Science in Mathematics and Computer Science. Students in this curriculum who plan to continue into graduate studies are urged to include among their elective courses as many 300-level mathematics courses as possible, especially 310, 311, 312, 340, 341, 342. The requirements of the curriculum are:

English Composition 101, 102	8 hours
Credit or exemption in 106 of a modern language	0-24
Liberal Arts and Sciences area requirements in humanities and social sciences	24
Mathematics 130, 131, 132, 133, 195, 220, 250[1] 280, 281, 290, and 348[2]	45

[1] Mathematics 371 with its prerequisites may be taken instead of Mathematics 250.

[2] Mathematics 342 with its prerequisites may be taken instead of Mathematics 348.

Mathematics 307 or 310 or 313 or 343	3-5
Three courses selected from Mathematics 387 through 397[3]	9
Physics 111, 112, 113[4]	14
Information Engineering 210, 211	5
Two courses selected from Information Engineering 212 and 311, or 240 and 340, or 212 and 240	8
Electives	38-64

[3] With the consent of the adviser some of these 9 credit hours may be taken in Mathematics 398 (Special Topics in Mathematics) if the topics are pertinent to computer science.

[4] This requirement provides the student with experience in the natural sciences in laboratory courses. It is also a way of meeting prerequisites for Information Engineering 210. With consent of the adviser other ways of meeting these objectives may be approved.

Music

William Kaplan, D.Mus., Acting Head of the Department.

Associate Professors: William Kaplan, D.Mus.; Richard Norton, Ph.D.

Assistant Professors: Melvin Burks, M.Ed. (Adjunct); Euana Gangware, M.Mus.; Nicholas Valenziano, M.Mus.; Victor Weber, Ph.D.

Instructors: Richard Billingham, M.Mus.; Marie Goodkin, M.Mus (Visiting); Bruce Hayden, M.Ed. (Adjunct); Pauline Kennel, M.Mus.; David Stigberg, M.Mus.; Charles Walton, M.Ed. (Adjunct).

Lecturers: Maxine Kanter, M.Mus. (Visiting); Harriette Tiegreen.

Assistants: Richard Ave Maria, B.A.; Jacqueline Pyzik, B.A.; Susan Tinkle, B.A.

Students must pass a placement examination to qualify as music majors or to elect a minor field of specialization in the Department of Music. Those who fail this examination may petition the department for individual consultation.

Credit earned in Music 100 may not be applied toward either the major or the minor field of specialization.

Major—For the Bachelor of Arts, 60 hours, including:
Music 101, 102, 103, 104, 105, 106, 110, 170, 171, 201, 202, 203, 204, 205, 206, 230, 231, 232, 300, 301, 302 and three hours to be selected from the following:[1] 151, 152, 153, 154, 155, 156, 158, 159.

[1] No more than 1 hour of credit earned in any quarter may be applied toward the 3-hour requirment in these courses.

Departmental Distinction: A candidate must be eligible for college honors and must have an average of 4.500 in all courses taken in the Department of Music.

Minor—Students from other departments who wish to minor in music must take 32 hours, including:

Music 101, 102, 103, 104, 105, 106
170, 230, 231, 232, and two hours from
Music 151, 152, 153, 154, 156, 158, 171

Philosophy

Myles Brand, Ph.D., Head of the Department

Professors: George T. Dickie, Ph.D.; Arthur I. Fine, Ph.D.; Daniel J. Morris, Ph.D.; Brian F. Skyrms, Ph.D.; Irving Thalberg, Ph.D.

Associate Professors: Sandra L. Bartky, Ph.D.; Myles Brand, Ph.D.

Assistant Professors: Daniel P. Berger, M.A.; David C. Blumenfeld, Ph.D.; John J. Economos, B.A.; Neal K. Grossman, Ph.D.; Richard Kraut, Ph.D.; Ralf Meerbote, Ph.D.; Ihru Nahm, M.A.; Robert R. Page, M.A.; Paul R. Teller, Ph.D.; John S. Turner, M.A.; W. Kent Wilson, Ph.D.

Instructors: Joshua T. Rabinowitz, M.A.

Major—For the Bachelor of Arts, 42 hours, including:
Philosophy 201, 203, and 211
30 additional hours in philosophy
Philosophy 299, Seminar, is recommended.

Majors area assigned a departmental adviser.

Departmental Distinction: Awarded by the department on the basis of course work and an original paper. Consult with the department about eligibility and procedures to be followed.

Minor—20 hours in philosophy, 12 of which must be at the 200 or 300 level.

Physics

Professors: Swaminatha Sundaram, D.Sc., Head of the Department; Seymour Bernstein, Ph.D.; Arnold R. Bodmer, Ph.D.; Warren B. Cheston, Ph.D.; James W. Garland, Ph.D.; James S. Kouvel, Ph.D.; Edward B. McNeil, Ph.D.; Antonio Pagnamenta, Ph.D.; Rupert M. Price, M.S. (Emeritus); Ora L. Railsback, Ph.D. (Emeritus); R. Curtis Retherford, Ph.D.; Herman B. Weissman, Ph.D.; Lester Winsberg, Ph.D.

Associate Professors: Stanley Aks, Ph.D.; William R. Anderson, M.S.; Richard A. Carhart, Ph.D.; Helmut Claus, Ph.D.; Alan S. Edelstein, Ph.D.; Howard S. Goldberg, Ph.D.; Gloria T. Hoff, Ph.D.; Herman J. Johnson, M.S.; Stephen J. Krieger, Ph.D.; Seymour Margulies, Ph.D.; Donald W. McLeod, Ph.D.; William J. Otting, Ph.D.; John N. Pappademos, Ph.D.; David S. Schreiber, Ph.D.; Ram R. Sharma, Ph.D.; Harold M. Skadeland, M.A.; Julius Solomon, Ph.D.; David J. Vezzetti, Ph.D.

Assistant Professors: Larry L. Abels, Ph.D.; Robert J. Abrams, Ph.D.; Jared W. Haslett, M.S.; Jack A. Kaeck, Ph.D.; Isidor Lerner, M.A. (Emeritus); Arthur L. Licht, Ph.D. (Visiting); Fischel E. Moraine, *Dipl. Ing.* (Emeritus); Ben Varga, Ph.D.

Assistants: Rahim Afshar, C.A.S.; Robert G. Aitken, B.S.; Robert K. Bender, M.S.; Yun-Nan Ching, B.S.; Richard Delzenero, B.S.; Naim Elyashar, M.S.; Stewart O. Fong, M.S.; Antonios Gonis, M.S.; Raymond Jasinski, B.A.; Richard L. Mitton, B.S.; Panagiota Moutsos, M.S.; Panagiotis Panagoulias, B.S.; Constantine Panos, M.S.; Lambert Schoonveld, M.S.; Annapoorni Shadagopan, M.S.; Vengipura Shadagopan, M.S.; Ashok Sharma, M.S.; James Sienicki, M.S.; Vasundara Venkatraman, M.S.; Randall F. Wade, M.S.; Russell Whitman, M.S.; Leonard W. Winchester, M.S.; Chung C. Wong, M.S.

Major—For the Bachelor of Arts, 56 hours, including the following:

Physics 111, 112, 113, 114	19 Hours
221, 222	5
301, 302	8
321, 322	8
341, 361	8

plus two 300-level courses to be chosen in consultation with the adviser.

Required Prerequisite and Collateral Courses—
Mathematics 104 an; 105 (if needed), 130 131, 132, 133, 220, 310, 311
Chemistry 112, 113, 114

Note: Students may substitute, on the advice of the department, Chemistry 117, 118, 119 for Chemistry 112, 113, 114 if total hours required in their program do not exceed 108.

Departmental Distinction: Candidates must register for Physics 291, 292, or 293 to be considered. Awards of Distinction, High Distinction, and Highest Distinction will be based on the overall quality of the student's course work and the recommendation of the instructor in the above courses.

Minor—Students from other departments who wish to minor in physics must take Physics 111, 112, 113, 114, 221, 222, 301 and one course from the following: Physics 321, 371, 331, 341, 302.

Teacher Education in Physics: Requirements for Teaching in Secondary Schools

Major—56 hours including the following:

Physics 111, 112, 113, 114	19 Hours
221, 222	5
301, 302	8
321, 322	8
341, 361	8

Supporting Courses—42 hours

Mathematics 130, 131, 132, 133	20 Hours
220, 310, 311	10
Chemistry 112, 113, 114	12

Plus two physics laboratory courses, chosen in consultation with the adviser.

Minor—(Second field of specialization)—31 hours

Physics 111, 112, 113, 114	19 Hours
221	4
Physics electives	8

The Physics Curriculum

The Bachelor of Science in Physics is awarded students who successfully complete this curriculum in the College of Liberal Arts and Sciences.

180 hours, exclusive of physical education and basic military science, distributed as follows:

English Composition 101, 102	8 Hours
Chemistry 117, 118, 119	18
Foreign language (the equivalent of two years in a single language, at the college level)	0-24
Social Science	12
Humanities	12
Mathematics 130, 131, 132, 133	20
220, 310, 311	10
Physics 111, 112, 113, 114	19
221, 222	5
301, 302, 303, 304	16
321, 322, 341, 342	16
361, 371, 381, 382	16
Electives	9-33

Political Science

Professors: David C. Leege, Ph.D., Head of the Department; Hollis W. Barber, Ph.D.; Twiley W. Barker, Jr., Ph.D.; Doris A. Graber, Ph.D.; Richard M. Johnson, Ph.D.; Boyd R. Keenan, Ph.D.; B.C. Koh, Ph.D.; Milton Rakove, Ph.D.

Associate Professors: George D. Beam, Ph.D.; Don R. Bowen, Ph.D.; Thomas J. Cook, Ph.D.; Eugene Eidenberg, Ph.D.; Catherine M. Kelleher, Ph.D.; Lyman A. Kellstedt, Ph.D.; Dick W. Simpson, Ph.D.; Frank Tachau, Ph.D.

Assistant Professors: George I. Balch, Ph.D.; Elinor R. Bowen, Ph.D.; Anne M. Heinz, Ph.D.; Paul J. Hiniker, Ph.D. (Visiting); Peter R. Knauss, Ph.D.; Michael A. Murray, Ph.D.; Andrew K. Prinz, Ph.D. (Visiting); Frank P. Scioli, Jr., Ph.D.

Instructors: Charles F. Levine, M.A.; Kaye Miller, M.A.

Assistants: Marc Broudo, B.A.; Mark A. Chapin, M.Div.; Jeanne Cosgrove, M.A.; Douglas H. Haeuber, B.A.; Thomas Lalagos, B.A.; Janet S. Lind, B.A.; Boyd T. Reese, Jr., M.Div., M.B.A.; Harold Schwartz, B.A.; Mark P. Sherman, B.A.; Marsha A. Silverman, M.A.

Major—For the Bachelor of Arts, 36 hours, distributed as follows:

Any two 100-level political science courses, including at least one of the following: 100, 120, 150, or 151. Students cannot take both 150 and 151. 28 additional hours in political science.

A major may include 5 hours from related departments, chosen with the advance approval of the Department of Political Science.

Departmental Distinction: To be considered for departmental distinction the student must have an all-University grade-point average of 4.250, an average of 4.500 in all his political science courses, must present an acceptable essay written while he is enrolled in Political Science 299 (both course and credits must be beyond those required for the major), and pass a comprehensive examination in political science. A student working in this program must expect to enroll in Political Science 299 for at least 4 hours credit during his tenth and/or eleventh quarters; thus, if he expects to graduate in June, he should enroll during the fall and/or winter quarters of his senior year. Further details may be obtained in the Department of Political Science Office.

Minor—Any two 100-level political science courses, including at least one of the following: Political Science 100, 120, 150, or 151. Students cannot take both 150 and 151.
16 additional hours of political science courses, 12 of which must be at the 200 or 300 level, chosen in consultation with an adviser in the Department of Political Science.

Psychology

Professors: Leonard D. Eron, Ph.D., Chairman of the Department; Philip Ash, Ph.D.; Gershon Berkson, Ph.D.; Louis Berman, Ph.D.; Rosalind Cartwright, Ph.D.; John Davis, Ph.D.; I.E. Farber, Ph.D.; Paul Greene, Ph.D.; Harold Klehr, Ph.D.; Eli Lipman, Ph.D.; Susan Markle, Ph.D.; Sheldon Rosenberg, Ph.D.; Robert Wyer, Ph.D.

Associate Professors: Jerry Adams, Ph.D.; Roger Dominowski, Ph.D.; Philip Freedman, Ph.D.; Charles Gruder, Ph.D.; Allen Howard, Ph.D.; Vivian Lipman, Ph.D.; Nan E. McGehee, Ph.D.; Leon Miller, Ph.D.; Alexander Rosen, Ph.D.; Gerald Senf, Ph.D.; Herbert Stenson, Ph.D.; Judith Torney, Ph.D.

Assistant Professors: Raymond Bennett, Ph.D.; Alan Benton, Ph.D.; Ernest Kent, Ph.D.; Leonard Kroeker, Ph.D.; Michael Levine, Ph.D.; Rolf Peterson, Ph.D.; Steven Reiss, Ph.D.; Maris Rodgon, Ph.D.; Leonard Sushinsky, Ph.D.

Instructors: Dennis Doty, M.A.; Christopher Keys, M.A.; Bruce Korth, M.A.; Ronald Martell, M.A.

Assistants: Rlynn Ackerman, B.A.; Susan Andrews, B.A.; Riva Bachrach, B.A.; Ilene Bailey, B.A.; Jean Bartunek, B.A.; Steven Berman, B.A.; Darlene Blumenthal, B.A.; Claire Brunegraff, B.A.; Larry Byrd, B.A.; Adalton Caram, B.A.; Susan Cartwright, B.A.; Daniel Coldeway, B.A.; Mark Cohen, B.A.; Barbara Collins, B.A.; Craig Coopersmith, B.A.; Linda Crnic, B.A.; Jorge Daruna, B.A.; Richard Delaney, B.A.; Robert Dulski, B.A.; Nestor Dyhdalo, B.A.; John Elliott, B.A.; Susan Fierstein, B.A.; Paulette Fischer, B.A.; Irene Fujitomi, B.A.; Carol Gill, B.A.; Carolyn Gralewski, B.A.; Tomacine Henek, B.A.; John Hennessy, M.A.; Patricia Huth, B.A.; Kenneth Jacobs, B.A.; Paul Johnson, B.A.; Jane Kaplan, M.A.; Alfred Kaszniak, B.A.; Deborah Kelfer, M.A.; Lawrence Koranda, B.A.; Roger Larsen, B.A.; Carol Millman, B.A.; Mary Ellen Milos, M.A.; Carol Peterson, M.A.; Anne Rabinow, B.A.; Daniel Romer, B.A.; Erica Rosenfeld, B.A.; Clifford Rot, B.A.; John Rottschafer, B.A.; William Schiller, B.A.; Diane Signatur, B.A.; Joan Smith, B.A.; Alfred Stumpfhauser, B.S.; Suzanne Turner, B.A.; Orest Wasyliw, B.A.; William Webb, B.A.; Michael Weiss, B.A.; Cynthia West, B.A.; Jeanne Whittemore, B.A.; Evelyn Williams, B.A.; Jill Zirlin, B.A.; Michael Zolno, M.A.; Thomas Zrout, B.A.

Student Counseling Service

Associate Professors: James W. Creaser, Ph.D.; Barry S. Greenwald, Ph.D.

Assistant Professors: Mary Jane Luetgert, Ph.D.; George E. Melhus, Ph.D.; Chaya H. Roth, Ph.D.; Edward P. Sheridan, Ph.D.; Myron A. Whitman, Ph.D.

General Education Requirements.
Psychology 100, 101,[1] and 104 or 143

Major—For the Bachelor of Arts, 36 hours in psychology including:
Psychology 100, 101[1], 143, and 240 or 243
At least three from Psychology 210, 220, 230, 250, 251, 252, 255, 256
At least 8 additional hours in psychology courses numbered above 200

Departmental Distinction: A candidate must complete a major that includes the following courses:
Psychology 100, 101,[1] 143, and 243
At least three from Psychology 210, 220, 230, 250, 251, 252, 255, and 256
At least two from Psychology 260, 261, 262, 265, 266
Mathematics 101 or 104, 110, and 194 or Mathematics 101 (or 104 and 105), 130, 131
One year of laboratory courses in biology, chemistry, and/or physics
A candidate for departmental distinction must earn a 4.000 grade-point average in psychology courses numbered 200 and above and must be eligible for graduation with College Honors.

Note: Students who expect to apply for graduate work in psychology should complete the Departmental Distinction program.

Minor—24 hours, including Psychology 100, 101,[1] 143. Three from Psychology 210, 220, 230, 250, 251, 252, 255, and 256.

Religious Studies

Committee: James E. Landing, Ph.D., Chairman; Preston M. Browning, Ph.D.; Elizabeth Gebhard, Ph.D.; Alexander J. Rosen, Ph.D.

Minor—At least 24 quarter hours of approved courses at the 200 or 300 level in three different departments. Students are advised by members of the committee.

Slavic Languages and Literatures

Professors: Nicholas Moravcevich, Ph.D., Head of the Department; Tymond Terlecki, Ph.D. (Visiting)

Associate Professors: Elizabeth Pribic, Ph.D.

Assistant Professors: Wilma Hoffmann, M.A.; Janine Reklaitis, Ph.D.

[1] Credit for Psychology 101 will not be given to students who took Psychology 100 in residence prior to September 1970, or who have received transfer credit for an introductory course in psychology completed at another collegiate institution. These students must take an additional 4 hours of psychology to complete a major or a minor.

Instructors: George J. Gutsche, M.A.; Jean L. Hellie, M.A.; Renata Hostynska, M.A.; Jon L. Lutz, M.A.; Wanda L. Sorgente, M.A.; Nicholas A. Stroud, B.A.

Lecturers: Miroslav Samchyshyn, Ph.D. (Visiting)

For the Bachelor of Arts in Russian, the student may choose one of the following:

Major Only—48 hours beyond Russian 122, including Russian 201, 202, 203, 221, 222, and 223; Slavic 224; 20 hours of upper division courses in Russian of which at least 8 hours must be at the 300 level.

Major and Related Field—48 hours, as above, and
1. 24 hours of introductory courses and 8 hours at the 200 and 300 levels in any of the following fields: French, German, Greek, Italian, Latin, Portuguese, and Spanish or
2. 12 hours in 100-level courses and 16 hours in 200 and 300-level courses in any of the following fields: English, philosophy, speech.

Major with Prerequisite and Collateral Courses—48 hours, as above, and 37 additional hours from the relevant course offerings in history, political science, and geography selected in consultation with the student's adviser.

Minor—
1. Those who do not satisfy the College language requirement in Slavic languages take a total of 32 hours, including Russian 101 through 122 and 8 hours on the 200 and 300 levels, chosen with the approval of the Department of Slavic Languages and Literatures.
2. Those who have competence at the level of Russian 104 or beyond take 20 hours on the 200 and 300 levels, chosen with the approval of the Department of Slavic Languages and Literatures.

Departmental Distinction: A 4.500 average in all departmental lower-division courses, and a 4.750 average in all departmental upper-division courses taken.

Teacher Education in Russian: Requirement for Teaching in Secondary Schools

Major—52 hours beyond the 100 level including:
Russian 201, 202, 203, 204, 205, 221, 222, and 223; Slavic 224, 301, either 302 or 303, and 332
One elective from the following: Russian 215, 216, 230, History 235, 236, 237, or any 4 hour Russian literature course at the 300 level
The student must also qualify for the statement of fluency in Russian issued by the department.

Minor—32 hours including:
Russian 121, 122, 201, 202, 203, 204, 207, and either 230 or 332
The student must also qualify for the statement of fluency in Russian issued by the department.

Sociology

Professors: David B. Carpenter, Ph.D., Head of the Department; Bernard H. Baum, Ph.D.; M. Rue Bucher, Ph.D.; Robert E. Corley, Ph.D.; Robert L. Hall, Ph.D.; John W.C. Johnstone, Ph.D.; Peter P. Klassen, Ph.D.; Roger W. Little, Ph.D.; Mildred A. Schwartz, Ph.D.; Ethel Shanas, Ph.D.

Associate Professors: James T. Carey, Ph.D.; William W. Erbe, Ph.D.; John W. Martin, Ph.D.

Assistant Professors: Janet M. Alger, Ph.D.; Steven F. Alger, Ph.D.; Daniel J. Amick, Ph.D.; Pauline B. Bart, Ph.D.; R. Michael Buren, Ph.D.; Butler P. Crittenden, Ph.D.; Kathleen S. Crittenden, Ph.D.; Phyllis A. Ewer, Ph.D.; Hazel S. Fisher, Ph.D.; Keith R. Johnson, Ph.D.; Helen R. Miller, Ph.D.; James L. Norr, Ph.D.; Gerald M. Swatez, Ph.D.; Larry L. Tifft, Ph.D.; Mary Glenn Wiley, Ph.D.

Instructors: Brigitte M. Erbe, M.A.; Geoffrey F. Fox, A.B.; David M. Rubinstein, B.A.; Philip R. Weinberger, M.A.; James A. Wiley, M.A.

Major—For the Bachelor of Arts, 46 hours, including the following:
Sociology 100 or the equivalent
Sociology 201 or Psychology 243
Sociology 202
8 hours slected from Sociology 203, 300, 301, 302, 305, 306, 384, 385, 386, 387.
26 additional hours, 14 of which must be in sociology. Up to 12 hours may be from the approved list of collateral courses. Collateral courses may *not* be substituted for any of the specifically required courses.

Approved collateral courses:
Anthropology 200, 213, 310, 311, 314, 363
Biological Sciences 236
Criminal Justice 280, 330, 335, 340, 398
Economics 324, 326, 327, 332
Education 241, 242, 301, 371
Geography 210, 230, 251, 310, 330
History 286, 287, 296, 297, 386
Mathematics 194, 195
Philosophy 216, 222, 345
Political Science 205, 215, 230, 280, 305, 306, 327, 328, 331, 334, 381
Psychology 201, 220, 240, 247, 250, 251, 252, 280

Departmental Distinction: The requirements for candidacy are: a 4.000 all-University grade-point average, 4.000 grade-point average in sociology courses, and senior standing. The requirements for graduation with departmental distinction are: a 4.000 all-University grade-point average, 4.000 grade-point average in sociology courses, completion of all requirements for a major in sociology, and completion of Sociology 287 and 288 with at least a B. These requirements apply to any student who declared a major in sociology in September, 1967, or later.

Minor—20 hours in sociology, at least 12 of which must be in courses at the 200 or 300 level.

Teacher Education in Sociology: Requirements for Teaching in Secondary Schools

Major—48 hours, including the following:
Sociology 100, 130, 185, 243
24 additional hours in sociology, of which at least 16 hours must be at the 200 or 300 level.
Anthropology 150 or 130, and 160

Minor—32 hours, including the following:
Sociology 100, 130
Anthropology 160 and 130
16 additional hours in sociology at the 200 or 300 level.

The Department of Sociology strongly advises an approved teaching minor for majors in its teacher education program because sociology courses are not taught extensively in secondary schools. The completion of an approved minor qualifies the student to teach in another area.

Spanish, Italian, and Portuguese

Professors: Brian Dutton, Ph.D., Head of the Department; Eduardo Betoret-París, Ph.D.; Audrey L. Kouvel, Ph.D.; José Sánchez, Ph.D.

Associate Professors: Violet B. Bergquist, D.Lit.; Manuel Blanco-González, M.A.; Klaus Muller-Bergh, Ph.D.

Assistant Professors: Lucille V. Braun, Ph.D.; José Buergo, Ph.D.; James D. Compton, Ph.D.; Ruth El Saffar, Ph.D.; Margherita Harwell, Ph.D.; Hector Hernández-Nieto, Ph.D.; Jerry R. Rank, Ph.D.; Henry Sullivan, Ph.D.; Ferdina J. Tort, M.A.

Instructors: Constance K. Adelman, M.A.; Judith G. Chandran, M.A.; Mark J. Cramer, M.A.; Gerald Dreller, M.A.; Lydia Z. Fernández, M.A.; Norma W. Guice, M.A.; Franco Martinelli, M.A.; Dennis Nazak, M.A.; Jorge Rodríguez-Florido, M.A.; Ramona Spinka, M.A.; Shirley Verdugo-Pérez, M.A.

Lecturers: Americo Bugliani, M.A.; Ronald Perlman, B.A.

Assistants: Yvonne Berezecki, B.A.; Mary Brinas, B.A.; Reynaldo Caudillo, B.A.; Ignazio De Bellis, B.A.; Barbara Dembek, M.A.; Laura Dizon, B.A.; Teresa Durón, B.A.; Oksana Futala, B.A.; Christine Gómez, B.A.; Laura Hachenburg, B.A.; Bertha Hevia, B.A.; Margaret Hogan, B.A.; Rosamaria Limpin, B.S.; Catherine Link, B.A.; Irma Munoz, B.A.; Marco A. Pena, B.A.; Jose Rodríguez, B.A.; Zoryana Zabrosky, B.A.

*Major**—For the Bachelor of Arts, 45 hours, exclusive of courses in translation, including:
Spanish 218, 219, 221, 222, 223, 224
At least 6 hours of Spanish composition and conversation courses at the 200 level, chosen in consultation with a department adviser.

Majors are encouraged to take electives to complete the 45-hour requirement for the major that will give them a well-rounded background. Specifically, courses should be taken at the advanced level in both Spanish literature and Latin-American literature and in advanced language. Courses that deal with cultural aspects should also be considered.

Required Collateral Courses—24 hours, to be chosen in consultation with a department adviser.

Departmental Distinction: The student must complete at least 18 hours in upper-division courses with an average of 4.500 to be considered for departmental distinction.

Minor in Spanish, Italian, or Portuguese

Spanish: A minimum of 19 hours at the 200 level or above, exclusive of courses in translation. At least 6 hours must be in the 211-216 sequence, and at least 6

*All majors are subject to change by fall, 1973. Please check with the department.

additional hours must be in either 221 and 222 or 223 and 224. Courses must be chosen in consultation with the Department of Spanish.

Italian:

1. If Italian has not been offered to satisfy the foreign language requirement, a total of 32 hours, including Italian 101 through 106 and and 8 hours of 200-level courses or above in Italian, chosen with the approval of the Department of Spanish, Italian, and Portuguese, or
2. If Italian has been offered to satisfy the foreign language requirement, 20 hours at the 200 level or above, chosen with the approval of the Department of Spanish, Italian, and Portuguese.

Portuguese:

1. If Portuguese has not been offered to satisfy the foreign language requirement, a total of 32 hours, including Portuguese 101 through 106 and 8 hours of 200-level courses or above in Portuguese, chosen with the approval of the Department of Spanish, Italian, and Portuguese, or
2. If Portuguese has been offered to satisfy the foreign language requirement, 20 hours in Portuguese at the 200 level or above, chosen with the approval of the Department of Spanish, Italian, and Portuguese.

Teacher Education in Spanish: Requirements for Teaching in Secondary Schools:

*Major**—52 hours including:
Spanish 211, 212, 213, 214, 215,
216, 218, 221, 223 or 224,
231, 232, 252, 253,
280, 281, 349
At least 6 hours at the 300 level (or above, with the consent of the department) in addition to Spanish 349.

Minor—30 hours
Spanish 104, 105, 106,
211, 212, 213,
214, 215, 216

*All majors are subject to change by fall, 1973. Please check with the deaprtment.

Speech and Theater

Professors: R. Victor Harnack, Ph.D., Head of the Department; Donald H. Dickinson, Ph.D.; Chester C. Long, Ph.D.; Carl A. Pitt, Ph.D.; Harry J. Skornia, Ph.D.

Associate Professors: Grace Holt, M.A.; Thomas M. Kochman, Ph.D.; Katharine T. Loesch, Ph.D.; Natalie Schmitt, Ph.D.; Barbara S. Wood, Ph.D.

Assistant Professors: Julia M. Curry, M.S.; Sanford D. Horwitt, Ph.D.; Conde R. Hoskins, M.A.; Helen J. Hovde, M.A.; John A. Jones, Ph.D.; Theodore V. Kundrat, M.A.; William F. Raffeld, M.A.

Instructors: Ann H. Armstrong, M.A.; George Caldwell, M.A.; Janice M. Crews, M.A. (Emerita); John Dimmick, M.A.; Frances M. Goulson, M.T.A. (Emerita); Judith O'Malley, M.A.; Joel Sternberg, M.A.

Assistants: Carol Berthold, M.A.; Theodore Chiolak, B.A.; David Handler, B.A.; Cheryl Kamlager, B.A.; Harold Miller, B.A.; Marcyliena Morgan, B.A.; Stanley Stanczyk, B.A.

Major—for the Bachelor of Arts, 44 hours exclusive of Speech 100, 101, and 141. At least 24 hours must be at the 200 or 300 level, and all major programs must include Speech 201 or 202. Majors must demonstrate proficiency in public speaking and oral reading at the Speech 101, 141 levels.

Majors elect one of three programs: *Communications and Public Address, Theater and Oral Interpretation, or Mass Media.* Consult the department office for examples of programs in these areas. Choices will be made in consultation with a department adviser.

Departmental Distinction: A candidate must have a cumulative grade-point average of 4.000 and a grade of B in Speech 298; with High Distinction, either a cumulative grade-point average of 4.000 and a grade of A in Speech 298 or a cumulative grade-point average of 4.250 and a grade of B in Speech 298; with Highest Distinction, a cumulative grade-point average of 4.250 and a grade of A in Speech 298.

Minor—At least 28 hours, chosen in consultation with an adviser in the Department of Speech and Theater. At least 12 of the 28 must be at the 200 or 300 level.

Teacher Education in Speech: Requirements for Teaching in Secondary Schools

Communications and Public Address:

Major—48 hours
Speech 101 or 102, 141, or proficiency[1]
111, 112, 113
121, 122, 123, 201 or 202
211, 212, 213, 295

Minor—30 hours
Speech 101, 141, or proficiency[1]
111, 112, 113, 201 or 202
211 or 212 or 213

Theater and Oral Interpretation:

Major—48 hours
101 or 102, 141, or proficiency[1]
111 and 112 or 113
121, 122, 123, 151
201 or 202, 211 or 212 or 213
241, 261, 264, 295
Electives: 0-22 hours

Minor—30 hours
101, 141 or proficiency[1]
121, 122, 123, 151
201 or 202, 241, 264

The Preprofessional Programs

The College offers work that prepares students to enter the following professional fields: medical dietetics, medical record administration, medical technology, dentistry, law, medicine, nursing, pharmacy, physical therapy, and veterinary medicine. A partial program in occupational therapy is also offered.

Meetings are arranged throughout the academic year to permit students in the preprofessional programs to discuss academic problems with representatives from the professional colleges. However, admission to a preprofessional curriculum does not guarantee admission to a professional

[1] If the student demonstrates proficiency in Speech 101 and 141 (by department examination), additional hours must be taken to achieve the 48-hour requirement for the major and the 30-hour minimum requirement for the minor.

school; nor does attainment of the minimum grade-point average for one of the curricula listed below in itself assure admission. If he is not admitted to a professional school, a student may continue to work for a baccalaureate at the University of Illinois at Chicago Circle by meeting all the graduation requirements of the College of Liberal Arts and Sciences.

Medical Dietetics— 90 quarter hours, exclusive of formerly required physical education and basic military science, distributed as follows:

English Composition 101, 102	8 hours
Natural sciences	50
Biological Sciences 100, 101, 102, 250	
Chemistry 112, 113, 114, 232, 233, 234	
Mathematics 104, 105	
Social sciences	12
Economics 120	
Psychology 100 or 101	
Sociology 100	
Humanities	12
Electives	8

The minimum grade-point average for admission to the University of Illinois at the Medical Center in the field of medical dietetics is 3.000.

The third and fourth years are taken in the School of Associated Medical Sciences of the College of Medicine, which also awards the degree.

Medical Laboratory Sciences—135 quarter hours, exclusive of formerly required physical education and basic military science, distributed as follows:

English Composition 101, 102	8 hours
Natural sciences	69
Biological Sciences 100, 101, 102, 250 and 7 additional hours	
Chemistry 112, 113, 114, 121, 232, 233, 234	
Physics 101, 102, 103*	
Social sciences	12
Humanities	12
Electives (24 hours of foreign language are highly recommended) to complete the required total of 135 hours	34

The minimum grade-point average for admission to the University of Illinois at the Medical Center in the field of medical technology is 3.000.

The fourth year consists of four quarters and begins in June. It is taken in the School of Associated Medical Sciences of the College of Medicine, which also awards the degree.

***Mathematics courses to fulfill prerequisites for physics courses may be met by placement or by course work.**

Humanities	12
Electives (24 hours of foreign language are highly recommended) to complete the required total of 135 hours	34

The minimum grade-point average for admission to the University of Illinois at the Medical Center in the field of medical technology is 3.000.

The fourth year consists of four quarters and begins in June. It is taken in the School of Associated Medical Sciences of the College of Medicine, which also awards the degree.

***Mathematics courses to fulfill prerequisites for physics courses may be met by placement or by course work.**

Medical Record Administration—135 quarter hours, exclusive of formerly required physical education and basic military science, distributed as follows:

English Composition 101, 102	8 hours
Natural sciences	34
Biological Sciences 100, 101, 102, 133, 134	
Physical Sciences (12 hours)*	
Social sciences	12
Humanities	12
Electives	69

24 hours of foreign language are highly recommended.
*Courses selected in consultation with adviser.

The minimum grade-point average for admission to the University of Illinois at the Medical Center in the field of medical record administration is 3.000.

The fourth year is taken in the School of Associated Medical Sciences of the College of Medicine, which also awards the degree.

Occupational Therapy —The first year is taken in the General Curriculum of the College of Liberal Arts and Sciences. A student must be personally interviewed by the Director of the Occupational Therapy Curriculum of the School of Associated Medical Sciences, the College of Medicine, University of Illinois at the Medical Center, or by a designated representative before he is admitted to the curriculum.

First Year

English Composition 101, 102	8 hours
Physical sciences	12-15
Chemistry 112, 113, 114 or	
Natural Sciences 101, 102, 103	
Psychology 100 or 101	4
Sociology 100, 130	8
Humanities	12
Physical education (highly recommended)	3

The second and third years are taken on the Urbana campus.

The minimum grade-point average for admission to the University of Illinois at the Medical Center in the field of occupational therapy is 3.500.

The fourth and fifth years (16 consecutive calendar months) are taken at the Medical Center. The School of Associated Medical Sciences of the College of Medicine awards the degree.

Physical Therapy—90 hours, exclusive of formerly required physical education and basic military science, distributed as follows:

English Composition 101	4 hours
Natural sciences:	50-52
Biological Sciences 100, 101, 102	
Chemistry 112, 113, 132	
Physics 101, 102, 103	
Mathematics 100, 101 or 104 and 105	
Social sciences:	12
Psychology 100, 221 or 220 and 280	
Humanities	8
Electives	14-16
Physical Education 151 highly recommended	3

The minimum grade-point average for admission to the University of Illinois at the Medical Center in the field of physical therapy is 3.500.

The third and fourth years are taken in the School of Associated Medical Sciences of the College of Medicine, which also awards the degree.

Predentistry—Student must take the Dental Aptitude Test. Application forms and details may be obtained from the Office of the College of Liberal Arts and Sciences, 350 University Hall.

90 quarter hours, exclusive of formerly required physical education and basic military science, distributed as follows:

English Composition 101, 102	8 hours
Chemistry 112, 113, 114, 233, 234 or 117, 118 119, 232, 233, 234	25-28
Biological Sciences 100, 101, 102	12
Physics 101, 102	10
Electives (Physics is recommended.)	32-35

To receive a B.S. in Dentistry, the student must have completed one year of a foreign language before he enters dental school.

The minimum grade-point average for admission to the College of Dentistry of the University of Illinois at the Medical Center is 3.250.

Bachelor's Degree. The College of Liberal Arts and Sciences accepts a total of 48 quarter hours or 32 semester hours of credit from an accredited college of dentistry to enable the student to complete the requirements for both a bachelor's degree and a degree in dentistry in seven rather than the usual eight years. This program requires (1) that the student be in good standing in the college of dentistry; (2) that work taken in the college of dentistry does not duplicate work taken in predental courses; (3) that the

courses be in such fields as biochemistry, physiology, histology, or anatomy as approved by the College of Liberal Arts and Sciences and by the major department; (4) that the student complete at Chicago Circle the third or last year of predental study consisting of at least 45 quarter hours of credit, thus satisfying the residence requirement; and (5) that the student meet all other requirements for graduation, including a field of specialization (the major), from the College of Liberal Arts and Sciences.

Prelaw—The education of a lawyer begins long before admission to law school. Prelaw education should be concerned with the development of basic skills and insights in the areas of (1) verbal comprehension and expression in words, (2) critical understanding of the human institutions and values with which the law deals, and (3) creative and logical thought. Law schools do not prescribe certain preprofessional courses but rather require an undergraduate curriculum of high quality with regard to breadth and depth of academic accomplishment. In addition, they seek students who have the capacity for self-direction, independence of thought, and clarity of expression.

To be considered for admission to the College of Law of the University of Illinois, a student must have received a baccalaureate degree from an accredited college or university and must have achieved a satisfactory score on the Law School Admission Test. The faculty of the College of Law has prepared a pamphlet, *Education for a Career in Law,* that suggests various courses and programs that may be helpful in preparing for study of the law. It may be obtained from the College of Law, University of Illinois, Champaign, Illinois 61820.

The Association of American Law Schools prepares a *Prelaw Handbook* each year. Introductory chapters in this official guide discuss undergraduate course selection and application procedures. Also included is specific information on most of the nation's law schools.

Premedicine—The Catalog of the University of Illinois College of Medicine states the following: "Students seeking admission to the College of Medicine must:

1. Demonstrate in addition to academic achievement, the emotional maturity, the integrity, and the motivation judged necessary for the successful study and practice of medicine.
2. Have received a baccalaureate degree (ordinarily B.A. or B.S.) from a recognized college or university or be eligible to receive such a degree upon satisfactory completion of the curriculum of the first year in the College of Medicine. Students from colleges that do not grant a degree after the satisfactory completion of the first year of medicine may be considered for admission after satisfactory completion of three years (not less than 90 semester hours) of college work if such students are eligible for full senior status (i.e., eligibility to receive a baccalaureate degree after completion of the senior year) in that college."

The undergraduate program must include as a minimum:

Biological Sciences 100, 101, 102	12 hours
Chemistry 112, 113, 114	15
Chemistry 232, 233, 234 and 235, 236 or 121 (Chemistry 237 is recommended.)	16
Physics 101, 102, 103	15

The college major should be in the field that the student finds most interesting. If he chooses a division of science, he should obtain the broadest experience possible in the humanities; if he chooses the humanities, he should be certain to include the minimum science requirements but not necessarily limit himself to them. The College of Medicine would expect some studies, but would not require specific sequences, in English and foreign languages. Mathematics through calculus is recommended. Psychology and sociology are examples of studies that effect an understanding of human behavior and that will complement studies both in the sciences and the humanities.

The University of Illinois College of Medicine endeavors to select applicants who demonstrate the academic achievement, emotional stability, maturity, integrity, and motivation necessary for the successful study of medicine. The Committee on Admissions is interested in evidence of capacity for mature and independent scholarship, not in rigid patterns of course work. The Committee will consider the quality of work of each applicant in all areas, the breadth of education, achievement in advanced projects, or work experience that demonstrates the applicant's imagination, initiative, and creativity, regardless of race, creed, color, or sex.

Specific Requirements

1. Students may seek admission to the College of Medicine with any undergraduate major. Courses in biology, chemistry through organic, physics or biophysics, and the behavioral sciences will be particularly helpful in preparing for study in the College of Medicine. However, major fields may be in the humanities, the fine arts, or the behavioral, biological, or physical sciences. Mathematics through calculus is especially recommended for those anticipating advanced work in basic or clinical research.
2. Applicants without baccalaureate degrees should be eligible to receive such a degree upon satisfactory completion of the curriculum of the first year in the College of Medicine.

   Bachelor's Degree. The College of Liberal Arts and Sciences accepts a total of 48 quarter hours or 32 semester hours of credit from an accredited college of medicine to enable the student to complete the requirements for both a bachelor's degree and a medical degree in seven rather than the usual eight years. This program requires (1) that the student be in good standing in the College of Medicine; (2) that work taken in the College of Medicine does not duplicate work taken in premedical courses; (3) that the courses be in such fields as biochemistry, physiology, histology, or anatomy as approved by the College of Liberal Arts and Sciences; (4) that the student complete at Chicago Circle the

third or last year of premedical study, consisting of at least 45 quarter hours of credit, thereby satisfying the residence requirement; and (5) that the student meet all other requirements for graduation from the College of Liberal Arts and Sciences, including a field of specialization (the major).

3. All candidates must take the Medical College Admission Test.
4. Letters of recommendation are required of all applicants.
5. An interview may be requested by the Committee on Admissions or by the applicant.

Prenursing—45 quarter hours, exclusive of physical education and basic military science distributed as follows:

English Composition 101, 102	8 hours
Natural sciences	18
Biological Sciences 100, 101 (102 is recommended.)	
Chemistry 112, 132	
Social sciences	8
Psychology 100 or 101	
Sociology 100	
Humanities	8
Electives	3

The minimum grade-point average for admission to the College of Nursing of the University of Illinois at the Medical Center is 3.250.

Prepharmacy—45-51 hours, exclusive of formerly required physical education, health science, and basic military science, distributed as follows:

English Composition	8 hours
Natural sciences	35-43
Biological Sciences 100, 101, 102	
Chemistry 112, 113, 114 or 117, 118, 119	
Mathematics 100, 101 or 104, 105	
Electives	0-2

A student may elect to remain a second year, in which case his program will be as follows:

Biological Sciences 280	5 hours
Chemistry 232, 233, 234, 235, 236, 237	16
Physics 101, 102, 103	15
Mathematics 130	5
Electives	4

The minimum grade-point average for admission to the College of Pharmacy of the University of Illinois at the Medical Center is 3.250.

The College of Pharmacy awards the degree of Bachelor of Science in Pharmacy for 189 hours of credit beyond the prepharmacy program.

Preveterinary Medicine—A student must take the Veterinary Aptitude Test. Information regarding this test may be obtained from the Office of the College of Liberal Arts and Sciences, 350 University Hall. The minimum grade-point average for admission to the College of Veterinary Medicine of the University of Illinois at Urbana is 3.500. The student must satisfactorily complete 90 hours, exclusive of formerly required physical education and basic military science, distributed as follows:

English Composition 101, 102	8 hours
Natural sciences	52-57
Biological Sciences 100, 101, 102	
Chemistry 112, 113, 114, or 117, 118, 119 and 232, 233, 234, 235, 236	
Physics 101, 102, 103	
Humanities and social sciences*	24
Electives	

*Courses are selected in consultation with a college adviser.

The School of Physical Education

Sheldon L. Fordham, Ed.D., Director
Charles J. Kristufek, M.S., Associate Director

The School of Physical Education serves a threefold function: first, it offers a program wherein the student may develop a variety of sport skills and may learn the theoretical and practical aspects of physical fitness; second, it offers a professional program in which the student may major in physical education and earn the Bachelor of Science; third, it offers extracurricular programs in intercollegiate and intramural sports, fitness activities, and dance.

The General Education Program in Physical Education

The service program is designed for non-physical education majors who desire to develop skills and knowledge in sport, dance, or athletic activities and/or desire to develop physical fitness as well as basic concepts of the physiology of exercise. Courses with a PEM or a PEW prefix are service program courses.

Students who do not major in physical education ordinarily select courses with a PEM or PEW prefix, but they may take courses designed for physical education majors, which are designated by a PE prefix.

Pass-Fail Grade Option. Non-physical education majors may elect to take a physical education course on a pass-fail basis. The option may be elected by completing a pass-fail form in the Service Program Offices during the third week of the quarter.

Intercollegiate and Intramural Athletics

A complete program of intercollegiate athletics, including cross country, soccer, football, ice hockey, basketball, swimming, gymnastics, wrestling, fencing, track and field, baseball, tennis, and golf is maintained.

Over 20 activities comprise the Men's and Women's Intramural Programs under the supervision of the Intramural Director.

Women's Athletic Association, Chicago Circle Dancers, and Aquianas Synchronized Swim Club

The Women's Athletic Association offers all women students the opportunity to participate in an intercollegiate sports program. The main objective of W.A.A. extramurals is to give the highly skilled participant an opportunity to compete against other schools.

Chicago Circle Dancers offers opportunities for men and women to participate in a variety of dance activities, such as folk and square dance, modern jazz, ballet, and modern dance forms and to work creatively in group and individual choreography and production.

Aquianas Synchronized Swim Club competes against other midwestern colleges and also hosts various synchronized-swimming clinics for Chicago area schools.

The Professional Program

Graduate Program Coordinator: Dorothy F. Gillanders

Physical Education for Men

Leo L. Gedvilas, Head of the Department
Charles J. Kristufek, Supervisor of the Professional Program
Matthew H. Ellsworth, Supervisor of the Service Program

Professors: Peter R. Berrafato, M.S.; Sheldon L. Fordham, Ed.D.; John O. Jones, M.S. (Emeritus); Charles J. Kristufek, M.S.

Associate Professors: Leo L. Gedvilas, M.S.; Lester H. Miller, M.A.; Benedict W. Montcalm, M.A.; Lawrence B. Oscai, Ph.D.; William H. Roetzheim, M.S.; Walter G. Versen, M.Ed.

Assistant Professors: Robert L. Beck, M.Ed.; James C. Descourouez, M.Ed.; Matthew H. Ellsworth, M.Ed.; Harold H. Nemoto, M.A.; Richard R. Rader, M.S.; Thomas F. Russo, M.Ed.; Thomas P. Sattler, M.S.; Donald G. Scherrer, Ph.D.

Instructors: Robert W. Danner, M.S.; Samuel Donnelly, Jr., M.A.; William F. Fudala, M.A.; Leonard J. Gramarossa, M.S.; Randolph C. Ketlinski, M.A.; William F. Leach, M.S.; Ralph W. Mackh, M.Ed.; Michael B. McGovern, M.S.; Philip H. Van Slooten, M.A.; Paul T. Wright, M.S.

Lecturers: James R. Darrah, B.S.; Richard R. Fahey, B.S.; Edward J. McQuillan, B.S.

Physical Education for Women

Helen M. Heitmann, Acting Head of the Department and Supervisor of the Professional Program
Linda L. Bain, Supervisor of the Elementary Education Program
Marian E. Kneer, Supervisor of the Teacher Education Program
Carol J. Ladwig, Supervisor of the General Education Program

Professors: Helen M. Barton, Ed.D. (Emerita); Dorothy F. Gillanders, Ed.D.; Helen M. Heitmann, D.P.E.

Associate Professors: Wilma J. Pesavento, Ph.D.

Assistant Professors: Linda L. Bain, M.S.; Mary A. DiVito, Ph.D.; Marian E. Kneer, Ph.D.; Carol J. Ladwig, M.S.; Mary E. McQuiety, M.S.; Frances E. Sweeney, M.A.

Instructors: Karen L. Beck, M.S.; Elizabeth Brown, M.S.; Suk Hyun Chai, M.S.; Mary Kapsalis, M.S.; Anne K. Klinger, M.A.; Concetta M. Licausi, M.A.; Nina K. Pappas, M.S.

Lecturers: Anna Neumann, B.S.; Erna Wachtel

The professional program is designed to prepare the student for the physical education profession. It includes a core curriculum and three optional tracks.

Every student majoring in physical education is required to complete the 66 hour core curriculum during the first two years. During the second year, the student, with the aid of an adviser, selects one of three professional tracks. The student seeking state certification to teach physical education in grades kindergarten through 12 should complete Option I; the student seeking state certification for high school teaching should complete Option II; and the student interested in a non-teaching area should select Option III.

Option I is designed to meet the professional needs of the student who is primarily interested in teaching physical education and also in coaching. Option II is designed for the student whose primary interest is coaching in a high school and whose secondary interest is teaching physical education and, possibly, teaching a subject other than physical education. Option III is designed to meet the needs and interests of the student who desires to go into the field of exercise therapy or dance or recreation (private or public) or who, may desire to prepare for a career in research in such areas as exercise physiology, kinesiology, motor learning, sociology of sport, psychology of sport, or another related field. Each option includes some hours of electives in required areas and some hours of free-elective courses. The student may use the physical education elective hours and the free-elective hours to become a teaching "generalist," or he may concentrate on one area of interest and become a teaching "specialist." He may use the general education electives and free-electives to gain a wide range of experience, or he may apply these hours toward a minor outside the field of physical education.

Freshmen who wish to enter the professional curriculum must meet the entrance requirements of the School of Physical Education. Students who transfer from another institution or from another college of the University must meet the following grade-point requirements: students with less than 90 quarter hours of credit—3.300 cumulative average or higher; students with 90 quarter hours of credit or more—3.500 cumulative average or higher.

The Bachelor of Science in Physical Education is awarded upon the completion of 186 or 194 hours of credit, including 66 hours in the Core Program, the total number of hours depending upon which option is selected.

In addition, all of the general University requirements for graduation must be met. See *General University Requirements.*

Core Program, 66 hours. Required of all physical education majors.

General Education	39 hours
English Composition 101, 102	
Biological Sciences 133, 134	
Speech 100, 101	
Sociology 100	
Psychology 100	
Philosophy 101	
Humanities elective, 4 hours	
Physical Education	27 hours
PE 150, 151, 152, 153, 154, 251, 252, 253, 254	

Options.

In addition to the core, the student must complete the requirements of one of the following options:

Option I, 120 hours. K-12 Certification:

General Education	31 hours
History 151	
Political Science 151	
Education 205 or 201—Health science courses	
Electives, 20 hours	
Education	28 hours
Education 170, 210, 230, 270, 271	
Physical Education	50 hours
Physical Education 275, 276, 277, 278, 279, 235, 281	
8 hours for men, 6 hours for women selected from:	
Physical Education 171, 172, 173, 174, 175, 177	
8 hours for men and women from the following:	
Men—Physical Education 156, 161, 162, 164, 230, 231	
Women—Physical Education 155, 156, 157, 158, 159, 160, 161, 162, 230, 231	
For women, 4 hours from:	
Physical Education 190, 191, 192, 193, 194	
For Men, 14 hours, for women, 12 hours selected from Physical Education 155 through 234	
Electives in physical education or another field	11 hours
Total hours for graduation (Core plus Option I)	186

Option II, 128 hours. Secondary School Certification:

General Education	45 hours
History 151	
Political Science 151	
Education 205, Health science course	

Electives, 34 hours (It is recommended these hours be used in meeting requirements for a teaching minor.)	
Education	28 hours
Education 170, 210, 230, 270, 271	
Physical Education	48 hours
Physical Education 277, 278, 279, 281, 282	
8 hours for men and 6 hours for women selected from:	
Physical Education 171, 172, 173, 174, 175, 177	
For men and women, 8 hours from the following:	
Men—Physical Education 156, 161, 162, 164, 230, 231	
Women—Physical Education 155, 156, 157, 158, 159, 160, 161, 162, 230, 231	
For women, 4 hours from:	
Physical Education 190, 191, 192, 193, 194	
For men, 14 hours, for women, 12 hours selected from	
Physical Education 155 through 234	
Electives in physical education or another field	7 hours
Total hours for graduation (Core plus Option II)	194

Option III, 120 hours. Non-Certification

Selected with the consent of the adviser, this option is for the student with interest in such areas as exercise physiology, kinesiology, motor learning, and the sociology or psychology of sport, Dance, recreation, or exercise therapy.	
Total hours required for graduation (Core plus Option III)	186

Kinesiotherapy Program. The physical education major who desires to become a candidate for Certification in Corrective Therapy is required to complete satisfactorily the courses listed below, the requirements of the core program, and one of the optional programs.

Physical Education 261, 263, 264, 270, 275, 279, 287, and 308	41 hours
Psychology 101, 143, 210, 256, 280	20 hours
Total hours	61

Recreation Minor. The recreation curriculum is designed to prepare leaders for recreational agencies. Students who are not physical education majors and physical education majors who satisfactorily complete the following courses become certified recreation leaders:

Physical Education 240, 241, 243, 244, 245 or 246, 248	22 or 23 hours
Minimum of 10 hours in one area and a minimum of 3 hours in a second area, selected with the approval of a faculty adviser, from the following:	
Area I—Art	
Area II—Camping	
Area III—Speech and Theater	
Area IV—Music	
Area V—Physical Education	
Total hours	35 or 36

Coaching Minor. This minor is available to students who are not physical education majors. The course requirements are as follows:

Physical Education 150, 253, 254, 277, 282, 285, and 8 hours selected from courses numbered Physical Education 155-234.	
Total hours	30

Honors

The student graduates with honors if his or her cumulative grade-point average for all university work taken at Chicago Circle is 4.000 or higher.

The Certificate of Merit is awarded to the graduating student who has maintained a minimum grade-point average of 4.750 in all physical education courses and in student teaching. Names of recipients are inscribed on a plaque in the Physical Education Building.

Courses of Instruction

Quarterly Timetables must be consulted for courses to be offered during a given quarter; the frequency of the offerings is determined by the departments, colleges, and schools and as program requirements dictate and staff availability permits. Assurance cannot be given that specific courses will be offered each year. Requirements stated in the department sections serve as a guide to program planning; department advisers will counsel students on individual programs within the major.

Courses are grouped alphabetically. Following the number and title of each course is a statement of credit given, content, and prerequisites (if any).

Definition of a Credit Hour.: A University credit hour represents one classroom hour of fifty minutes weekly for one quarter, in lecture or recitation, and either the necessary preparation time or a longer time in laboratory or other exercises for which outside preparation is not required. It is expected that most students will spend two hours of preparation for one hour per week of lecture or recitation. Each University quarter-hour credit is thus understood to represent at least three hours of the student's time.

Additional Required Course Work: Those courses in which credit hours exceed clock hours may require additional readings, assigned papers, or other course work.

Courses numbered 100 to 199 are open to all undergraduate students.

Courses numbered 200 to 399 are open only to juniors and seniors and those other students meeting course prerequisites.

ALL-CAMPUS (CC)

CC299. CONTEMPORARY TOPICS. 1 TO 4 HOURS. Total credit may not exceed 8 hours. The same topic may not be repeated for credit.

ACCOUNTING (Actg)

100. ACCOUNTING I. 3 HOURS. Concepts and principles underlying the processing and reporting of accounting information for decision making. Prerequisite: Sophomore standing.

101. ACCOUNTING II. 3 HOURS. Internal control as it affects the processing of accounting information; relationship between assets and earnings; effects of valuation methods on income determination. Prerequisite: Actg. 100.

102. ACCOUNTING III. 3 HOURS. Managerial use of accounting information in decision making and planning; standards and budgets as a guide to measuring operating performance. Prerequisite: Actg. 101.

300. MANAGERIAL COST ACCOUNTING. 4 HOURS. Analysis of costs for control, decision making, and planning; standards and budgets as a guide to measuring operating performance. Prerequisite: Actg. 302.

301. ASSET VALUATION AND INCOME DETERMINATION. 4 HOURS. The development, applications, and limitations of accounting theory as related to the valuation of assets and measurements of income. Prerequisite: Actg. 102.

302. ACCOUNTING FOR ENTITY INTEREST. 4 HOURS. Accounting for rights of creditors, stockholders, and partners in a going concern; effects of expansion and contraction on equities; basic principles of fiduciary and fund accounting. Prerequisite: Actg. 301.

303. AUDITING. 4 HOURS. The history, function, and theory of auditing; nature of the necessary evidence for the accountant's professional opinion concerning a financial position and the results of enterprise operations; applications of statistical sampling; auditing computerized systems. Prerequisite: Actg. 302.

304. FEDERAL INCOME TAX. 4 HOURS. Concepts of federal income tax; its effects on decisions of corporations, partnerships, individuals, and trusts. Prerequisite: Actg. 300 or consent of the instructor.

305. PLANNING AND CONTROL. 4 HOURS. The budget as a formal plan of action; the effect of decision making, forecasting, and uncertainty on the determination of enterprise goals; guidance techniques for the accomplishment of the planned objectives of a firm. Prerequisite: Actg. 300.

306. READINGS AND ADVANCED PROBLEMS. 4 HOURS. Consolidated statements, foreign subsidiaries, insurance, estates, theory, general statements. Prerequisites: Actg. 302.

307. FEDERAL INCOME TAX—ADVANCED. 4 HOURS. Advanced development of the basic concepts discussed in Accounting 304. Tax factors affecting business decisions of corporations, partnerships, estates, and trusts; special problems in reorganizations, liquidations, and personal holding companies; the federal estate tax and gift tax. Prerequisites: Senior standing and Actg. 304.

ANTHROPOLOGY (Anth)

130. INTRODUCTION TO PHYSICAL ANTHROPOLOGY. 4 HOURS. Required for anthropology majors. Human orgins and developments; emphasis on fossil man and races.

133. HUMAN BIOLOGY I. 5 HOURS. Same as Biological Sciences 133. Survey of the structure and functions of the human body; interrelationships of the various organs and systems. Lecture, laboratory. Prerequisite: 1 year of biological sciences or consent of the instructor.

134. HUMAN BIOLOGY II. 5 HOURS. Same as Biological Sciences 134. The morphology and physiology of the human body; emphasis on the interrelationships of the various organs and systems. Three lectures and 6 hours of laboratory per week. Prerequisite: Anth. 133.

150. INTRODUCTION TO ARCHAEOLOGY. 4 HOURS. Required for anthropology majors. General survey of world archaeology; special reference to the origins and development of Old World cultures.

160. INTRODUCTION TO SOCIAL ANTHROPOLOGY. 4 HOURS. Required for anthropology majors. Survey of selected cultures of the world; emphasis on the concepts and methods of ethnology and social anthropology.

165. AFRO AND LATIN AMERICAN CULTURES OF NORTH AMERICA. 4 HOURS. Same as Black Studies 165 and Latin American Studies 165. A synchronic and diachronic survey of the subcultures of minority populations in North America; emphasis on Black and Latin American groups that have emerged in urban areas.

200. SOCIAL AND CULTURAL THEORY. 4 HOURS. Required for anthropology majors. Theoretical approaches to the study of culture and society in terms of structure, function, and process. Prerequisites: Anth. 130, 150, and 160 or consent of the instructor.

201. FOLKLORE. 4 HOURS. Examination of the genres of oral tradition; special attention to the folklore of nonliterate societies. Emphasis on problems of origins, modes of transmission, structure, and functions of folklore. Prerequisite: Anth. 160 or consent of the instructor.

211. HISTORY OF ETHNOGRAPHIC FILM. 4 HOURS. The history of documentaries on anthropology, and of how film has been used in anthropological research, from 1895 to the present. Prerequisite: 4 hours of social sciences or consent of the instructor.

213. KINSHIP AND SOCIAL STRUCTURE. 4 HOURS. Required for anthropology majors. Introduction to the study of social systems, with particular reference to kinship systems, lineage organizations, and collateral groupings as they structure social organization in primitive societies. Prerequisite: Anth. 160 or consent of the instructor.

215. DYNAMICS OF CULTURE. 4 HOURS. Introduction to the study of culture change, including the concepts of acculturation, culture contact, and diffusion. Prerequisite: Anth. 160 or consent of the instructor.

219. LANGUAGE AND CULTURE. 4 HOURS. Language as an aspect of culture, the influence of culture on language, and the cultural role of semantic ambiguity. Attention is given to the problems of language in ethnographic field research and to problems of translation between cultures. Prerequisite: Anth. 160 or consent of the instructor.

220. CULTURE AND PERSONALITY. 4 HOURS. Introduction to the concepts, theories, and techniques of studies relating the psychology of the individual to his culture and the results of some of these studies in selected nonliterate societies. Prerequisite: Anth. 160 or an introductory course in psychology or consent of the instructor.

225. NON-WESTERN RELIGIONS. 4 HOURS. Same as Religious Studies 225. Exploration of the varieties of religious experience, including magic and witchcraft; the roles of priesthood, prayers, scriptures, and ceremonials in social integration; the nature of sectarian movements. Prerequisite: 4 hours of either anthropology, psychology, or sociology or consent of the instructor.

230. BIO-ANTHROPOLOGY. 4 HOURS. The major principles of physical anthropology: human evolution, anthropometry, and functional anatomy; genetics and race; growth and constitution. Prerequisites: Anth. 130 and one year of biological sciences.

231. PRINCIPLES OF HUMAN EVOLUTION. 4 HOURS. Required for anthropology majors. The early and current theories prevalent in physical anthropology and the significance of these theories in contemporary research in biological anthropology. Prerequisites: Anth. 130 and BioS. 100, 101, and 102 or consent of the instructor.

235. BIOLOGY AND EVOLUTION OF HUMAN BEHAVIOR. 4 HOURS. Same as Biological Sciences 235. Comparative behavior of human and nonhuman primates; biological bases of primate behavior in terms of general evolutionary trends. Critical review of the analytic methodology of the behavioral sciences. Prerequisites: One year of biological sciences and Anth. 130 or consent of the instructor.

236. HUMAN GENETICS. 4 HOURS. 3 hours, lecture; 1 hour, quiz-discussion. Same as Biological Sciences 236. For anthropology majors and others interested in the social or biological aspects of human genetics, or for students who are unprepared for Biological Sciences 240. Basic genetic principles applied to human heredity and diversity, family analysis, chromosomal and genic anomalies, and population, racial, and social variations. Prerequisites: Three quarters of biological sciences, Math. 130, and three quarters of chemistry.

245. THEORY IN ARCHAEOLOGY. 4 HOURS. Required for anthropology majors. Analysis of the methods and objectives of archaeology in the setting of behavioral science. Emphasis on current trends in prehistoric archaeology. Prerequisite: Anth. 200 or consent of the instructor.

250. OLD WORLD ARCHAEOLOGY I. 4 HOURS. The evolution of the Old World hunting/collecting cultures to the end of the Pleistocene. Prerequisite: Anth. 150.

251. OLD WORLD ARCHAEOLOGY II. 4 HOURS. Introduction to the prehistoric cultures of the Old World, the post-Pleistocene hunting/collecting cultures, and the Stone Age farming cultures. Prerequisite: Anth. 150.

252. NEW WORLD ARCHAEOLOGY I. 4 HOURS. Same as Latin American Studies 252. Introduction to the prehistoric cultures of the New World from the populating of the Americas to the beginning of the formative cultural period in the Americas. Prerequisite: Anth. 150.

253. NEW WORLD ARCHAEOLOGY II. 4 HOURS. Same as Latin American Studies 253. Introduction to the prehistoric cultures of the New World from the formative cultural period to the high civilizations of Mesoamerica and South America. Prerequisite: Anth. 150.

255. FIELD METHODS IN ANTHROPOLOGY. 4 TO 12 HOURS. Supervised participation in field research. Techniques and procedures are discussed and practiced under actual field conditions at an off-campus location. Prerequisites: Anth. 130, 150, or 160, and consent of the instructor.

261. ETHNOGRAPHY OF MESOAMERICA. 4 HOURS. Same as Latin American Studies 254. Preconquest civilization of Mesoamerica, the interaction of Spanish and indigenous cultures, and the present Indian cultures of this area. Prerequisite: Anth. 160 or consent of the instructor.

263. ETHNOGRAPHY OF AFRICA. 4 HOURS. A survey of the culture areas of sub-Saharan Africa and study, in the ethnographic present, of societies typical of each culture area. Prerequisite: Anth. 160 or consent of the instructor.

264. ETHNOGRAPHY OF NORTH AMERICA. 4 HOURS. A survey of the indigenous cultures of the Indians of North America, including some studies in culture contact. Prerequisite: Anth. 160 or consent of the instructor.

265. ETHNOGRAPHY OF SOUTH AMERICA. 4 HOURS. Same as Latin American Studies 255. A survey of the indigenous cultures in South America in the ethnographic present. Prerequisite: Anth. 160 or consent of the instructor.

266. ETHNOGRAPHY OF SOUTH ASIA. 4 HOURS. Survey of the peoples of India, Pakistan, and Ceylon; emphasis on the comparative roles of indigenous and introduced cultural elements. Prerequisite: Anth. 160 or consent of the instructor.

267. ETHNOGRAPHY OF THE PHILIPPINES. 4 HOURS A survey of selected indigenous cultures of the Philippine Islands; emphasis on subsistence patterns and social organization. Prerequisite: Anth. 160.

271. ACTION RESEARCH IN THE CITY. 4 HOURS. Methods and techniques of conducting applied research; the utility of research for social action and community development in urban areas. Examination and evaluation of traditional models of applied research in the light of the needs for positive social programs in the city. Strong emphasis on the description of applied urban research currently being conducted in Chicago in combination with an examination of applied research in other areas of the world. Development of a new model for action research in complex urban environments. Prerequisite: Anth. 160 or consent of the instructor.

272. METHODS OF ACTION RESEARCH. 4 HOURS. Discussion of the methods, techniques, and relationships involved in anthropological research that seeks to contribute to action programs, positive social change, and community development. Prerequisite: Anth. 271.

280. INTRODUCTION TO ANTHROPOLOGICAL LINGUISTICS. 4 HOURS. Required for anthropology majors. The concepts and techniques of anthropological linguistics with emphasis on its significance in the study of culture and society. Prerequisite: Anth. 160 or consent of the instructor.

299. HONORS COURSE. 4 HOURS. May be repeated for an additional 4 hours of credit. Individual study or research projects. Prerequisites: Senior standing, anthropology major, and 4.000 all-University average, or consent of the instructor.

310. PEASANT SOCIETIES. 4 HOURS. Research and reading in the comparative study of peasant societies in diverse regions of the world; special emphasis on a critical review of the anthropological literature delineating a peasant stratum of social organization and defining its characteristics. Prerequisites: Junior standing and 8 hours of social anthropology or 8 hours of sociology, and consent of the instructor.

311. CULTURAL PROBLEMS IN URBANIZATION. 4 HOURS. The processes of urbanization and of cultural and societal adjustments to urban life; case studies illustrate the variety of adjustments to urban life. Prerequisite: Anth. 213 or consent of the instructor.

314. KINSHIP, FAMILY, AND HOUSEHOLD. 4 HOURS. Comparative study of the institutions of marriage, family, and household; the extension of kinship norms and values to other aspects of culture and society. Prerequisite: Anth. 213 or consent of the instructor.

315. COMPARATIVE RELIGIOUS MOVEMENTS. 4 HOURS. Same as Religious Studies 315. Analysis of religious behavior; special reference to the emergence of messianic cults in Africa and Melanesia and among the North American Indians and New World Negroes. Prerequisites: Junior standing and 8 hours of social anthropology or 8 hours of sociology, and consent of the instructor.

316. ECONOMIC LIFE OF PRIMITIVE PEOPLES. 4 HOURS. Patterns of production, distribution, and consumption in non-Western cultures. Cultural variation in attitudes toward labor, concepts of poverty and prestige and wealth. Prerequisite: 8 hours of social anthropology; for nonmajors, junior standing and consent of the instructor.

317. THE CROSS-CULTURAL STUDY OF SOCIAL CONTROL. 4 HOURS. Cultural-jural structures in non-Western societies; modes of dispute settlement, nature and range of sanctions, and processes of social control. Prerequisites: Junior standing and Anth. 213 or 327 or consent of the instructor.

321. CULTURAL EVOLUTION. 4 HOURS. Critical review of theories; examination of ethnographic materials and data on cultural change and cultural contact for the purpose of examining the mechanisms of change. Prerequisite: Anth. 200 or consent of the instructor.

322. COMPARATIVE METHODS IN SOCIAL ANTHROPOLOGY. 4 HOURS. Introduction to the several kinds of comparative method, including field work, and small-sample and large-sample studies. Prerequisite: Anth. 213 or consent of the instructor.

325. MEDICAL ANTHROPOLOGY. 4 HOURS. Significance of anthropological analysis and the cross-cultural perspective for medical care. Medicine as a cultural adaptive system. Social organization, politics, and economics of medical care systems, folk and modern. Folk medicine. Cross-cultural perspectives on psychiatric care. Prerequisite: Anth. 200 or consent of the instructor.

327. PRIMITIVE POLITICAL SYSTEMS. 4 HOURS. Examination of data and theory pertinent to non-Western political systems; a cross-cultural study of political behavior. Prerequisites: Junior standing and Anth. 213 or consent of the instructor.

327. PRIMITIVE POLITICAL SYSTEMS. 4 HOURS. Examination of data and theory pertinent to non-Western political systems; a cross-cultural study of political behavior. Prerequisites: Anth. 213 and junior standing, or consent of the instructor.

330. PRIMATE EVOLUTION. 4 HOURS. Same as Biological Sciences 330. Paleontology and systematics of fossil primates as illuminated by the anatomy, ecology, and behavior of the living populations. Prerequisite: Anth. 231 or BioS. 282 or 318.

331. HUMAN EVOLUTION. 4 HOURS. Same as Biological Sciences 331. Phylogeny of the primate order and the problems of speciation; particular emphasis on the relative roles of culture and nature as selective forces in human evolution. Prerequisite: Anth. 230 or 231 or BioS. 282 or 318.

350. PROBLEMS IN PREHISTORIC ARCHAEOLOGY. 4 TO 12 HOURS. May be repeated for credit up to a total of 12 hours. Archaeological field techniques and principles of the study of prehistory. Case studies from selected areas of the Old and New Worlds. Prerequisites: 12 hours of archaeology and consent of the instructor.

351. PREHISTORY OF THE NEAR EAST. 4 HOURS. Consideration of southwestern Asia and northeastern Africa as the core area in which the first civilization emerged. Emphasis on the late Quaternary to about 5000 B.C. with regard to the interrelationships between changing environment, human ecology, and cultural evolution. Prerequisite: Anth. 251 or consent of the instructor for qualified students from other departments.

352. EARLY CIVILIZATION OF THE OLD WORLD. 4 HOURS. Early civilization and incipient urbanization in Eurasia and Africa, focusing on the development of urban centers and archaic states; attention to preconditioning factors in the post-Pleistocene, Mesolithic, and Neolithic Ages. Prerequisite: Anth. 251 or 351.

355. FIELD PROBLEMS IN ARCHAEOLOGY. 6 TO 12 HOURS. Application of advanced techniques to the solution of special problems of archaeological field investigations; laboratory analysis under actual field conditions at an off-campus location. Prerequisites: Anth. 245 or 255 or concurrent registration in Anth. 255 and consent of the instructor.

361. PROBLEMS IN MESOAMERICAN ETHNOLOGY. 4 HOURS. Same as Latin American Studies 354. Intensive investigation of selected problems from the Mesoamerican area; special emphasis on religion, economics, and social organization. Prerequisite: Anth. 261 or consent of the instructor.

362. PROBLEMS IN AFRICAN ETHNOLOGY. 4 HOURS. Survey of the indigenous cultures of Africa; native cultures as reconstructed coterminous with their early historical contacts with the Western world; some additional data on present-day African cultures. Prerequisites: Junior standing and Anth. 263 or consent of the instructor.

363. URBAN CULTURES OF AFRICA. 4 HOURS. The indigenous urban centers of sub-Saharan Africa and the multicultural and multiracial metropolitan areas of colonial and contemporary Africa; special reference to the processes of segregation and detribalization. Prerequisite: Anth. 263 or 362 or consent of the instructor.

364. PROBLEMS IN NORTH AMERICAN ETHNOLOGY. 4 HOURS. Intensive reading and research focusing on special problems of religious, economic, and social systems of New World native peoples. Prerequisite: Anth. 264 or consent of the instructor.

365. PROBLEMS IN PACIFIC ETHNOLOGY. 4 HOURS. Ethnological survey of the indigenous peoples of Micronesia, Polynesia, Melanesia, and Australia; special emphasis on the social, economic, and religious life of representative groups. Prerequisites: Junior standing and 8 hours of social anthropology or consent of the instructor.

366. PROBLEMS IN SOUTH ASIAN ETHNOLOGY. 4 HOURS. Theoretical and substantive problems in the study of South Asian social organization; special emphasis on systems of social stratification, kinship and family structure, religion, economy, and political processes in the context of social change. Prerequisites: Junior standing, Anth. 213 and 266 or consent of the instructor.

367. PROBLEMS IN SOUTH AMERICAN ETHNOLOGY. 4 HOURS. Same as Latin American Studies 367. Intensive reading and research in theoretical and ethnographic problems in South American Indian social structures and cultures. Special attention is given to the influence of Levi-Strauss' ideas on the formulation of cultural theory in South America. Prerequisites: Anth. 213 and 265 or consent of the instructor.

368. PROBLEMS IN EUROPEAN ETHNOLOGY. 4 HOURS. Advanced reading and research in the ethnology of rural Europe; study in depth of selected case materials. Emphasis on community structure, kinship, religious and economic systems, and methods of social control; research techniques and the nature of source materials. Prerequisite: Anth. 213.

380. PROBLEMS IN LINGUISTIC ANALYSIS. 4 HOURS. Same as Linguistics 380. Examination of the methods and techniques used in linguistics, with reference to actual language data; emphasis on anthropological applications. Prerequisite: Anth. 280 or Ling. 305 or consent of the instructor.

395. SEMINAR IN ANTHROPOLOGY. 2 TO 4 HOURS. May be repeated for a total of 16 hours. Reading, study, and discussion of selected problems for graduate students and majors in anthropology; open, with the approval of the department, to seniors minoring in anthropology. Prerequisite: Consent of the instructor.

399. INDEPENDENT STUDY. 2 TO 12 HOURS. May be repeated for credit. Independent study under the supervision of a staff member. Prerequisites: Junior standing and approval of the department.

ARABIC (Arab)

101. ELEMENTARY ARABIC I. 4 HOURS. For students who have not studied the language. Modern written Arabic. Arabic of literature, science, and the news media. Reading skills, correct pronunciation, fundamental rules of grammar, oral and written self-expression.

102. ELEMENTARY ARABIC II. 4 HOURS. For students who have not studied the language. Modern written Arabic. Arabic of literature, science, and the news media. Reading skills, correct pronunciation, fundamental rules of grammar, oral and written self-expression. Prerequisite: Arab. 101 or the equivalent.

103. ELEMENTARY ARABIC III. 4 HOURS. For students who have not studied the language. Modern written Arabic. Arabic of literature, science, and the news media. Reading skills, correct pronunciation, fundamental rules of grammar, oral and written self-expression. Prerequisite: Arab. 102 or the equivalent.

ARCHITECTURE (Arch)

101. ARCHITECTURAL DESIGN I. 6 HOURS. Architectural design problems; emphasis on the development and organization of space. Prerequisite: A&A 104.

102. ARCHITECTURAL DESIGN II. 6 HOURS. Architectural design problems; emphasis on structure. Prerequisite: Arch. 101.

111. BUILDING TECHNOLOGY I. 4 HOURS. Wood and masonry construction and allied materials. Prerequisite: Concurrent registration in Arch. 102.

121. STATICS AND STRENGTH OF MATERIALS I. 3 HOURS. Equilibrium of bodies and systems subjected to parallel, colinear, parallel noncolinear, perpendicular, and general systems of concentrated forces. Distributed bonds, centroids, buoyancy, friction. Prerequisite: Math. 131.

122. STATICS AND STRENGTH OF MATERIALS II. 3 HOURS. Stresses and strains in tension and compression; moment of inertia; torsion; bending; shear and moment diagrams; stresses in beam; combined bending and aerial load. Prerequisite: Arch. 121.

123. STATICS AND STRENGTH OF MATERIALS III. 3 HOURS. Deflection of beams; statical indeterminancy; columns variation of stress and strain at a point; ultimate load, failure and safety. Prerequisite: Arch. 122.

199. INDIVIDUAL STUDY: SPECIAL TOPICS I. 1 TO 6 HOURS. May be repeated for credit for a maximum of 18 hours. Selected topics in architecture for individual investigation. Prerequisite: Consent of the instructor.

200. COMMUNICATION SKILLS. 5 HOURS. Nonverbal communication of simple and complex ideas and concepts of the structure and systems of man-made environment. Prerequisite: Junior standing—architecture students only.

201. ARCHITECTURAL DESIGN III. 6 HOURS. Architectural design problems; emphasis on environment control. Prerequisite: Arch. 102.

202. ARCHITECTURAL DESIGN IV. 6 HOURS. Comprehensive design problem incorporating site planning. Prerequisite: Arch. 201.

203. ARCHITECTURAL DESIGN V. 6 HOURS. Comprehensive design problems. Prerequisite: Arch. 202.

204. ARCHITECTURAL DESIGN PROBLEMS. 6 HOURS. Comprehensive design problems. Prerequisite: Arch. 203.

211. BUILDING TECHNOLOGY II. 4 HOURS. Steel construction and allied materials. Prerequisite: Arch. 111.

212. BUILDING TECHNOLOGY III. 4 HOURS. Concrete materials and allied construction. Prerequisite: Arch. 211.

213. BUILDING TECHNOLOGY IV. 4 HOURS. Electricity, illumination, and acoustics. Prerequisite: Arch. 212.

214. BUILDING TECHNOLOGY V. 4 HOURS Mechanical equipment, sanitation, heating and air conditioning. Prerequisite: Arch. 213.

215. BUILDING TECHNOLOGY VI. 4 HOURS. Comprehensive architectural problems. Prerequisites: Arch. 214 and concurrent registration in Arch. 204.

221. STRUCTURAL ENGINEERING I. 3 HOURS. Loads on buildings. Algebraic and graphical analysis of beams and trusses. Sloping beams. Statically determinate space structures. Cable systems. Prerequisite: Arch. 123.

222. STRUCTURAL ENGINEERING II. 3 HOURS. Approximate analysis of frames. Moment distribution method. Energy principles. Model analysis. Prerequisite: Arch. 221.

223. STRUCTURAL ENGINEERING III. 3 HOURS. Steel structures; properties of steel, design of tension members; columns; beams and connections. Design of steel buildings; roof trusses and rigid frames. Prerequisite: Arch. 221.

224. STRUCTURAL ENGINEERING IV. 3 HOURS. Concrete structures; properties of concrete and steel; design of columns, beams, slabs, two-way slabs, flat slabs, walls and foundations. Prerequisite: Arch. 221.

225. STRUCTURAL ENGINEERING V. 3 HOURS. Foundation types and design. Design of masonry and timber structures. Prerequisite: Arch. 221.

226. STRUCTURAL ENGINEERING VI. 3 HOURS. General problems in the selection and design of structural systems for buildings; structural design with aluminum, plastics, and other materials; elements of prestressed concrete; ultimate and plastic design; unconventional structural types. Prerequisites: Arch. 223, 224, and 225.

241. URBAN AND REGIONAL PLANNING I. 4 HOURS. Man's efforts to shape the physical environment of his community. Contemporary methods of controlling urban development. Prerequisites: For architecture students, Soc. 100 or the equivalent and Soc. 276; for other students, Soc. 100.

242. URBAN AND REGIONAL PLANNING II. 4 HOURS. Historical perspective. Prerequisite: Arch. 241.

299. INDIVIDUAL STUDY: SPECIAL TOPICS II. 1 TO 6 HOURS. May be repeated for credit for a maximum of 18 hours. Selected topics in architecture for individual investigation. Prerequisite: Consent of the instructor.

301. ARCHITECTURAL DESIGN VII. 6 HOURS. Comprehensive architectural problems. Prerequisite: Arch. 204.

302. ARCHITECTURAL DESIGN VIII. 6 HOURS. Comprehensive architectural design problems. Prerequisite: Arch. 301.

309. ARCHITECTURAL DESIGN THESIS. 6, 9, OR 12 HOURS. May be repeated for a total of 18 hours. Individual problems in architectural design. Prerequisite: Arch. 301.

311. FORENSIC ARCHITECTURE. 3 HOURS. Legal problems in architecture. Prerequisite: Fifth year standing.

312. COMPUTER APPLICATIONS IN ARCHITECTURE. 3 HOURS. The use of electronic computers in building design and construction. Prerequisite: Math. 194 or 195.

313. BUILDING CONSTRUCTION SYSTEMS. 6 HOURS. Static and dynamic environmental control systems. Prerequisites: Arch. 204 and 215.

314. INDUSTRIALIZED BUILDING. 3 HOURS. Prefabrication of building components. Prerequisite: Fifth-year standing.

315. LOGISTICS OF BUILDING CONSTRUCTION. 3 HOURS. Problems encountered in the logistics of building construction. Prerequisite: Fifth-year standing.

316. ENVIRONMENTAL CONTROL SYSTEMS. 6 HOURS. Problems of color, illumination, heating and air conditioning systems, and acoustics. Prerequisite: Arch. 313.

319. BUILDING TECHNOLOGY THESIS. 6, 9, OR 12 HOURS. May be repeated for a total of 18 hours. Individual problems in building technology. Prerequisite: Arch. 313.

321. FOUNDATIONS. 3 HOURS. Elements of soil mechanics; the selection and design of pile, caisson, raft, and other foundations. Prerequisite: Arch. 226.

322. STRUCTURAL SEMINAR. 3 HOURS. May be repeated for credit. Selected topics in structural analysis and design. Prerequisites: Completion of 200-level structural engineering courses and Math. 220.

323. INTERMEDIATE STRUCTURAL ANALYSIS. 6 HOURS. The analysis of statically indeterminate coplanar and space structures. Prerequisites: Completion of 200-level structural engineering courses and Math. 220.

324. STRUCTURAL DYNAMICS. 3 HOURS. Vibration, wind, and earthquake analysis and design of buildings. Prerequisite: Consent of the instructor.

326. INTERMEDIATE STRUCTURAL DESIGN. 6 HOURS. Plastic and limit methods of design, ultimate strength design, design of prestressed concrete members and structures. Prerequisite: Arch. 323.

329. STRUCTURAL THESIS. 12 HOURS. Individual problems in structures. Prerequisite: Arch. 326.

331. ARCHITECTURE SEMINAR. 1 TO 5 HOURS. May be repeated for a total of 15 hours. Current problems in architecture. Prerequisite: Fourth-year standing.

332. ARCHITECTURE READING COURSE. 1 TO 5 HOURS. May be repeated for a total of 15 hours. Individually planned readings on selected topics under the supervision of a faculty member. Prior to registration the student should be advised by the instructor. Prerequisite: Fourth-year standing.

339. ARCHITECTURAL HUMANITIES THESIS. 12 HOURS. Individual problems in the architectural humanities. Prerequisite: 21 hours in history of architecture.

343. PROFESSIONAL PRACTICE. 3 HOURS. Problems related to the practice of architecture. Prerequisite: Fifth year standing.

399. INDIVIDUAL STUDY: SPECIAL TOPICS III. 1 TO 6 HOURS. May be repeated for credit for a maximum of 18 hours. Selected topics in architecture for individual investigation. Prerequisite: Consent of the instructor.

ARCHITECTURE AND ART (A&A)

101. BASIC DESIGN I. 3 HOURS. The basic factors in two-dimensional and three-dimensional design. Students must register concurrently in Architecture and Art 111. Exceptions to this must be approved by the head of the department.

102. BASIC DESIGN II. 3 HOURS. More complex systems of two-dimensional and three-dimensional design. Introduction to color theory. Prerequisite: A&A 101.

103. BASIC DESIGN III. 3 HOURS. Theory and application; form and structure; three-dimensional models of systems. Prerequisite: A&A 102.

104. BASIC DESIGN IV. 3 HOURS. Form-movement-light-time in the form of machines or sculpture. Prerequisite: A&A 103.

111. VISUAL COMMUNICATIONS I. 2 HOURS. Introduction to the techniques. Students must register concurrently in Architecture and Art 101. Exceptions to this must be approved by the head of the department.

112. VISUAL COMMUNICATIONS II. 2 HOURS. Continues Architecture and Art 111. Prerequisite: A&A 111.

113. VISUAL COMMUNICATIONS III. 2 HOURS. Symbolic systems, image forming, and typography. Prerequisite: A&A 112.

114. VISUAL COMMUNICATIONS IV. 2 HOURS. Experimentation with the techniques and materials, including photography, used in two-dimensional expression. Prerequisite: A&A 113.

141. MAN AND ENVIRONMENT. 3 HOURS. Introduction to the nature of the professions of architecture and art in terms of the subjective and objective factors of architectural activity.

ART (Art)

100. ART TODAY. 4 HOURS. Open to all students. Architecture, painting, sculpture, film-photo, TV, mass media, and related areas; the forces which generated the new visual experience.

101. THE FILM AS A VISUAL ART. 4 HOURS. Open to all students. Growth and development of the film as an art form from the silent film to the present. The effect of film on visual attitudes and its relationship to other visual media, such as painting, communication design, and television.

102. PRINCIPLES OF ART. 4 HOURS. Open to all students. Introduction to the principles and techniques of two- and three-dimensional organization.

103. ART IN A TECHNOLOGICAL SOCIETY. 4 HOURS. Open to all students. The influence of technology on art and the impact of the resultant forms on society.

104. PAINTING TECHNIQUES. 4 HOURS. Open to all students. Introduction to painting; emphasis on formal study from visual experience in conjunction with investigation of methods and materials.

105. DRAWING TECHNIQUES. 4 HOURS. Open to all students. Introduction to the fundamentals of drawing.

106. THE ARTS OF THE NATIVE AMERICAN. 4 HOURS. Open to all students. Study of the arts of the native American through projects and lecture. Stages of cultural development involving mythology, religion, ritual, dance, prose and poetry from the past to the present.

200. PHOTOGRAPHY. 4 HOURS. Open to all students. Lectures and demonstrations of the practical aspects and theoretical foundations of photography.

201. FILM AND REALITY. 4 HOURS. Open to all students. Lectures and demonstrations of the techniques, traditions, and problems of the visual communication of fact through the medium of film.

203. PRINTMAKING. 4 HOURS. Open to all students. Past and present activity and future possibilities of printmaking. Printmaking as a philosophical, social, and political force. Orientation to the techniques of stencil, relief, planographic, and intaglio processes.

204. ART FOR ELEMENTARY TEACHERS: STUDIES IN CREATIVITY. 4 HOURS. Opportunity for the elementary education major to understand the creative process through this experience in art. Prerequisites: Junior standing and Ed. 170.

205. DRAWING. 4 HOURS. Intermediate drawing techniques and experiences for the general university student. Prerequisite: Art 105.

206. CERAMICS I. 4 HOURS. Same as Art-Design 246. Basic techniques in clay forming processes; hand and potter's wheel. Prerequisite: Sophomore standing.

207. CERAMICS II. 4 HOURS. Same as Art-Design 247. More advanced techniques in clay forming; basic glaze formulation and firing techniques. Prerequisite: Art 206.

208. METHODS AND TECHNIQUES OF NATIVE AMERICAN ARTS AND CRAFTS. 4 HOURS. Native arts and crafts, including beadwork, metal work, fingerweaving, and quill work.

ART-DESIGN (AD)

100. MAN AND ENVIRONMENT. 4 HOURS. Introduction to the department program and to the nature of the professions of art and design. Prerequisite: Credit or concurrent registration in AD 101 and 111 or AD 200 and 201.

101. THREE-DIMENSIONAL EXPLORATIONS. 4 HOURS. Introduction to divergent methods of media exploration and resulting formal synthesis, using a broad range of three-dimensional related materials and basic hand and power tools. Prerequisite: Concurrent registration in AD 111.

102. VISUAL CONCEPTS: THREE-DIMENSIONAL. 4 HOURS. Introduction to convergent methods of visual problem solving and related organizational systems and design principles, using a variety of three-dimensional related materials with basic hand and power tools. Prerequisites: AD 101 and concurrent registration in AD 112.

103. LIGHT DOCUMENTS. 4 HOURS. Introduction to the characteristics of light and movement as they relate to environmental effects and photo-sensitive materials. Prerequisites: AD 102 and concurrent registration in AD 113.

111. TWO-DIMENSIONAL EXPLORATIONS. 4 HOURS. Introduction to divergent methods of media exploration and resulting formal synthesis, using a broad range of two-dimensional related materials and tools. Prerequisite: Concurrent registration in AD 101.

112. VISUAL CONCEPTS: TWO-DIMENSIONAL. 4 HOURS. Introduction to convergent methods of visual problem solving and related organizational systems and design principles, using a variety of two-dimensional related materials and tools. Prerequisites: AD 111 and concurrent registration in AD 102.

113. SIGNS, SYMBOLS, IMAGES. 4 HOURS. Introduction to the continuing evolution of visual signs, images, and symbol systems; processes used in generating them with a variety of expressive media. Prerequisites: AD 112 and concurrent registration in AD 103.

200. THREE-DIMENSIONAL ORIENTATION. 4 HOURS. Open only to transfer students with art credit. A special course in concepts and exercises adapted to the individual needs of art transfer students. Individualized evaluation and advisement. Prerequisite: Approval of the department.

201. TWO-DIMENSIONAL ORIENTATION. 4 HOURS. Open only to transfer students with art credit. A special course in two-dimensional concepts and exercises adapted to the individual needs of art transfer students. Individualized evaluation and advisement. Prerequisite: Approval of the department.

202. BASIC DRAWING. 4 HOURS. Introduction to drawing materials, concepts, and techniques. Prerequisite: Completion of the foundation program.

203. DRAWING. 4 HOURS. Intensive study of the human figure through an exploration of a variety of media. Prerequisite: AD 202.

204. ADVANCED DRAWING. 4 HOURS. Continuation and elaboration of drawing techniques, with emphasis on individual exploration of techniques and imaginative concepts. Prerequisite: AD 203.

205. DESIGN METHODS. 4 HOURS. Introduction to systematic methods for industrial and communications designers. Design morphology, problem solving, analysis, synthesis, and evaluation techniques. Prerequisites: Completion of the foundation program and enrollment in a communication design or industrial design sequence.

208. ELECTRONIC ART-DESIGN. 4 HOURS. A practical laboratory exploration into electronic sensors, processors, and effectors as applied to art and design processes. Prerequisite: Significant involvement in a related area or completion of the foundation program.

209. COLOR-PIGMENT AND LIGHT. 4 HOURS. Study of color: effects of visual radiant energy through pigments on two- and three-dimensional surfaces; color as physiological and psychological phenomena. Prerequisite: Completion of the first year foundation program.

210. COMMUNICATIONS DESIGN. 4 HOURS. Introduction to the social and cultural aspects of visual communications as they affect the individual. Prerequisite: Completion of the foundation program.

211. COMMUNICATIONS DESIGN I. 4 HOURS. Theory and application of the elements of communications design through experiments with image, letter, form, and illustration. Prerequisite: Completion of the foundation program.

212. COMMUNICATIONS DESIGN II. 4 HOURS. Inventive exploration of applications of illustrative techniques combining word and image, collage, and imprinting. Prerequisite: AD 211.

213. COMMUNICATIONS DESIGN III. 4 HOURS. Free and controlled manipulation of symbol, type, drawing, and photoimage from the two-dimensional plane to volume. Prerequisite: AD 212.

214. COMMUNICATIONS DESIGN IV. 4 HOURS. A comprehensive investigation of the elements and interrelations of communications design, demonstrated by research and analysis. Prerequisite: AD 213.

215. COMMUNICATIONS DESIGN V. 4 HOURS. Theory and application of the elements of typography. Prerequisite: AD 214.

220. INDUSTRIAL DESIGN. 4 HOURS. Introduction to the profession of industrial design and user-based problem-solving techniques. Orientation to the basic principles of structure, mechanics, electronics, and perspective drawing. Prerequisite: Completion of the foundation program.

221. INDUSTRIAL DESIGN I. 4 HOURS. An experimental approach to the utilization of functional structures, i.e., for support and suspension in tension and compression. Application of the foregoing principles to functional design. Prerequisite: Completion of the foundation program.

222. INDUSTRIAL DESIGN II. 4 HOURS. Studies of two-dimensional and three-dimensional presentations, sequential analysis, photo recording, charts, diagrams, drawings, and other visual materials. Prerequisite: AD 221.

223. INDUSTRIAL DESIGN III. 4 HOURS. Systematic two-dimensional and three-dimensional investigation of communication elements as they relate to design and planning for display and exhibition design. Prerequisite: AD 222.

224. INDUSTRIAL DESIGN IV. 4 HOURS. Analysis and planning preliminary to comprehensive projects involving the development of solutions to problems of production, logistics, and the like. Prerequisite: AD 223.

225. INDUSTRIAL DESIGN V. 4 HOURS. Projects developed from forming concepts. Natural and synthetic materials; heat, chemical, and mechanical processes. Prototyping techniques and material investigation. Prerequisite: AD 224.

230. PAINTING I. 4 HOURS. Construction and preparation of canvases, boards, papers, and other surfaces; mixing of grounds, glazes, and paints in their relationship to the two-dimensional image. Prerequisite: Completion of the foundation program.

231. PAINTING II. 4 HOURS. Abstract and figurative painting and drawing; their interrelations. Spatial relations, color, form, lighting, and texture. Subjective and controlled studies. Prerequisite: AD 230.

232. PAINTING: OBJECT-IMAGE. 4 HOURS. Object imagery, spatial relationships, and emotional, analytical, and psychological content in various media. Prerequisite: AD 231.

233. PAINTING: 4 HOURS. Theories of spatial organization, optical phenomena, experimental employment of various media. Prerequisite: AD 231.

234. PAINTING: SPACE AND COLOR. 4 HOURS. Theories and practices of color and color phenomena; pigment, light, and spatial illusion. Prerequisite: AD 231.

235. PAINTING: SPACE AND FORM. 4 HOURS. Object imagery, spatial relationships, and emotional, analytical, and psychological content in various media. Prerequisite: AD 231.

240. SCULPTURE. 4 HOURS. The traditions and major directions of contemporary sculpture. Orientation to a variety of three-dimensional concepts and working approaches. Prerequisite: Completion of the foundation program.

241. SCULPTURE I. 4 HOURS. Principles of kinetic sculpture through various means and materials. Prerequisite: Completion of the foundation program.

242. SCULPTURE II. 4 HOURS. Object oriented; emphasis on forming processes and materials. Includes preparatory drawings and sketches. Prerequisite: AD 241.

243. SCULPTURE III. 4 HOURS. Comprehensive sculpture, stressing form and shape concepts. Methods of addition and extension in various media. Prerequisite: AD 242.

244. SCULPTURE IV. 4 HOURS. Abstract sculpture. Investigation of the principles of light, color, volume, and scale, done as static constructions in various materials. Prerequisite: AD 243.

245. SCULPTURE V. 4 HOURS. Object oriented; emphasis on forming processes and materials. Includes preparatory drawings and sketches. Prerequisite: AD 244.

246. CERAMICS I. 4 HOURS. Same as Art 206. Basic techniques in clay forming processes; hand and potter's wheel. Prerequisite: Sophomore standing.

247. CERAMICS II. 4 HOURS. Same as Art 207. More advanced techniques in clay forming; basic glaze formulation and firing techniques. Prerequisite: AD 246.

250. PRINTMAKING. 4 HOURS. An introductory course: past and present activity and future possibilities of printmaking. Printmaking as a philosophical, social, and political force, with orientation to the various techniques of stencil, relief, planographic, and intaglio processes. Prerequisite: Completion of the foundation program.

251. PRINTMAKING: LITHOGRAPHY AND SERIGRAPHY. 4 HOURS. Object and abstract studies relating the principles of drawing and design to the techniques of lithography and serigraphy. Prerequisite: Credit or concurrent registration in AD 250.

252. PRINTMAKING: RELIEF AND INTAGLIO. 4 HOURS. Object and abstract studies relating the principles of drawing and design to the techniques of relief and intaglio. Prerequisite: Credit or concurrent registration in AD 250.

253. PRINTMAKING: OBJECT-IMAGE. 4 HOURS. Based on single and multiple-object imagery. Theory, technique, and practice in the various graphic media, emphasizing experimentation. Prerequisite: Credit or concurrent registration in AD 250.

254. PRINTMAKING: SPACE, FORM, COLOR. 4 HOURS. Advanced theories of spatial principles, form, and color, developed through the various printmaking media. Prerequisite: Credit or concurrent registration in AD 250.

255. PRINTMAKING: OBJECT AND ABSTRACT STUDIES. 4 HOURS. The relation of the principles of drawing and design to the techniques of relief and intaglio. Prerequisite: Credit or concurrent registration in AD 250.

260. PHOTOGRAPHY. 4 HOURS. Introduction to photography. Basic familiarity with camera, studio, and darkroom. Prerequisite: Completion of the foundation program.

261. PHOTOGRAPHY I. 4 HOURS. Basic familiarity with the camera, enlarger, and studio. Introduction to high contrast emulsions and related materials. Experimental use of the media. Prerequisites: Completion of the foundation program and concurrent registration in AD 266.

262. PHOTOGRAPHY II. 4 HOURS. Introduction to the communicative possibilities of the photographic statement as an isolate and as a series. Analysis of simple objects. Prerequisites: AD 261 and concurrent registration in AD 267.

263. PHOTOGRAPHY III. 4 HOURS. The photographic process applied to recording, documenting, and interpreting real life situations and events. Prerequisites: AD 262 and concurrent registration in AD 268.

264. PHOTO-FILM SYNTHESIS. 4 HOURS. Synthesis of photography-cinematography. Individual projects based on mixed media. Prerequisite: AD 263 or 273.

265. PHOTOGRAPHY IV. 4 HOURS. Applied photography in such diverse areas of the medium as experimentation, documentation, illustration, propaganda, design, and equivalence. Prerequisite: AD 264.

266. PHOTOGRAPHY COLLOQUIUM I. 1 HOUR. Films, lectures, and discussion relating to the appreciation and application of photography. Special lectures on related subjects. Prerequisites: Completion of the foundation program and concurrent registration in AD 261.

267. PHOTOGRAPHY COLLOQUIUM II. 1 HOUR. Films, lectures, and discussion relating to the appreciation and application of photography. Special lectures on related subjects. Prerequisites: AD 266 and concurrent registration in AD 262.

268. PHOTOGRAPHY COLLOQUIUM III. 1 HOUR. Films, lectures, and discussion relating to the appreciation and application of photography. Special lectures on related subjects. Prerequisites: AD 267 and concurrent registration in AD 263.

269. ARCHITECTURAL PHOTOGRAPHY. 4 HOURS. Special course in photography for students in architecture; environment, function, detail, models, scale, lighting, point of view. Prerequisite: Completion of either the architecture or art foundation program.

270. CINEMA. 4 HOURS. Basic film structure. Experimentation with time structure, persistence of vision, and cinematic expression through short-term projects using simple motion picture techniques. Prerequisite: Completion of the foundation program.

271. CINEMATOGRAPHY I. 4 HOURS. Communication of simple ideas with the motion picture camera. Basic use of various film handling methods; editing bench, splicer, projectors, and cameras. Prerequisites: Completion of the foundation program and concurrent registration in AD 276.

272. CINEMATOGRAPHY II. 4 HOURS. Continues Art-Design 271. Introduction to the time-space properties of cinema from different points of view through the use of live action and stop motion camera. Prerequisites: AD 271 and concurrent registration in AD 277.

273. CINEMATOGRAPHY III. 4 HOURS. Continues Art-Design 272. Advanced techniques. Sound track reading and cutting. Analysis of objects and events with the motion picture camera. Prerequisites: AD 272 and concurrent registration in AD 278.

274. ANIMATION. 3 HOURS. Special introduction to basic techniques, including CEL animation. Use of type, color, shape, and texture on the animation stand. Prerequisite: Completion of the foundation program.

275. CINEMATOGRAPHY IV. 4 HOURS. Credit is not given for this course until completion of a 300-level course. Comprehensive individual or group projects in various aspects of film making. Prerequisite: AD 264.

276. FILM COLLOQUIUM I. 1 HOUR. Writings on the theory of film. Film and the contemporary scene. Specific film showings and analysis. Special lectures by persons involved in the field. Prerequisites: Completion of the foundation program and concurrent registration in AD 271.

277. FILM COLLOQUIUM II. 1 HOUR. Film and the contemporary scene. Specific film showings and analysis. Emphasis on documentation. Prerequisites: AD 276 and concurrent registration in AD 272.

278. FILM COLLOQUIUM III. 1 HOUR. Film and the contemporary scene. Specific film showings and analysis. Prerequisites: AD 277 and concurrent registration in AD 273.

281. FOUNDATIONS OF ART EDUCATION. 4 HOURS. Methods and techniques of art teaching, emphasizing creative and artistic development and the application of psychological and educational theories and practices to the teaching of art. Prerequisites: Ed. 170 and 210.

282. ART EDUCATION THEORY. 4 HOURS. Problem solving, survey and evaluation of pertinent studies and theories in art education. Prerequisite: Credit or concurrent registration in AD 281.

283. ART EDUCATION PRACTICE. 4 HOURS. Practical experience in classroom teaching. Workshop in conjunction with selected elementary schools prior to taking Art-Design 284. Prerequisites: Junior standing and AD 281.

284. EDUCATIONAL PRACTICE WITH SEMINAR I. 8 HOURS. Same as Education 270. The first half of a practice teaching two-segment sequence, including seminar, to meet certification requirements for teaching in the elementary or the secondary school. Prerequisites: Ed. 250, admission to advanced standing, and recommendation of the department of specialization.

285. EDUCATIONAL PRACTICE WITH SEMINAR II. 8 HOURS. Same as Education 271. The second half of a practice teaching two-segment sequence, including seminar, to meet certification requirements for teaching in the elementary or the secondary school. Prerequisites: Ed. 250, credit or concurrent registration in AD 284, admission to or continuation of advanced standing, and recommendation of the department of specialization.

300. ART AND DESIGN SYNTHESIS. 4 HOURS. May be repeated for credit. Individual-project course. Students develop projects that synthesize the experience of 200-level courses in the Department of Art. Emphasis is on interdisciplinary activities. Prerequisites: 40 hours of 200-level courses in the Department of Art and approval of the department.

301. INDEPENDENT STUDY. 4 TO 12 HOURS. Students may enroll in more than one 4-hour section per quarter or may repeat the course in 4-hour sections in subsequent quarters. Independent study under the supervision of a staff member in an area of design or plastic and graphic arts not covered in the regular curriculum. The course is offered at the request of the student and only at the discretion of the staff members concerned. Prerequisites: 30 hours of 200-level courses and approval of the department.

303. PHOTOGRAPHY-FILM TUTORIAL. 4 TO 16 HOURS. Students may enroll in more than one 4-hour section per quarter or may repeat the course in 4-hour sections in subsequent quarters. Independent study course. Sustained projects in any area of film activity or still photography. Prerequisites: AD 265 or 275 or graduate standing and approval of the department.

305. PLASTIC AND GRAPHIC ARTS. 4 TO 16 HOURS. Students may enroll in more than one 4-hour section per quarter or may repeat the course in 4-hour sections in subsequent quarters. Individual projects in the plastic and graphic arts area are developed by each student through tutorial consultation with an assigned instructor; may involve supportive consultation in all areas of the department to permit breadth and invention in media and processes. Prerequisites: 25 hours of appropriate 200-level courses and approval of the department.

308. COMPUTER ART-DESIGN. 4 HOURS. A practical exploration into the computer as a tool for the artist-designer. Prerequisites: Senior standing and Math. 194 or the equivalent.

309. TEKART. 4 HOURS. Exploration into technological art; emphasis on group projects leading to exhibition or event. Prerequisites: Senior standing and AD 308 or 208.

310. COMMUNICATIONS DESIGN. 4 TO 16 HOURS. Students may enroll in more than one 4-hour section per quarter or may repeat the course in 4-hour sections in subsequent quarters. A comprehensive project in the area of social communications. A total program or a series of related units for use in one or more communications media is developed by each student through tutorial consultation with an assigned instructor. Prerequisites: AD 215 or graduate standing and approval of the department.

320. INDUSTRIAL DESIGN. 4 TO 16 HOURS. Students may enroll in more than one 4-hour section per quarter or may repeat the course in 4-hour sections in subsequent quarters. Design of physical systems based upon user behavior, technical resources, and environmental factors. Investigation of system failures and product dysfunctions at the man/machine, work space, and environmental levels. Projects are developed by the student through tutorial consultation with an assigned instructor. Prerequisites: AD 225 or graduate standing and approval of the department.

365. COLOR PHOTOGRAPHY. 4 HOURS. The processes, techniques, and materials of color photography. Prerequisite: AD 262.

BIOLOGICAL SCIENCES (BioS)

100. GENERAL BIOLOGY. 4 HOURS. Same as Information Engineering 100. With Biological Sciences 101 and 102, a three-quarter sequence which may be entered in any quarter. Audio-tutorial. Principles and fundamentals of biology through examination of diverse phenomena unique to biological systems. Lecture, laboratory, and discussion.

101. GENERAL BIOLOGY. 4 HOURS. Same as Information Engineering 101. Continues Biological Sciences 100.

102. GENERAL BIOLOGY. 4 HOURS. Same as Information Engineering 102. Continues Biological Sciences 101.

105. THE ZYGOTE AND BEYOND. 3 TO 4 HOURS. Students may elect a concurrent hour of Biological Sciences 193 for a total of 4 hours. Examination of experiments and ideas important to the appreciation of present-day concepts in developmental biology. Lecture. Prerequisite: Nonmajor James Scholar status.

106. BIOLOGY IN HUMAN AFFAIRS. 3 HOURS. Not offered for credit to students who have had Biological Sciences 124 or Natural Sciences 104. A look at man, his environment, and his relationship to other men, with the intent of providing a biological perspective for past, present, and future decisions.

124. NATURAL SCIENCES-LIFE EVOLVING. 4 HOURS. Same as Natural Sciences 104. Genetics, ecology, and evolution: the interaction of life and its environment—past, present, and future. Prerequisite: NatS. 103 or consent of the instructor.

133. HUMAN BIOLOGY I. 5 HOURS. Same as Anthropology 133. Survey of the structure and functions of the human body; interrelationships of the various organ systems. Lecture and laboratory. Prerequisite: One year of biological sciences or consent of the instructor.

134. HUMAN BIOLOGY II. 5 HOURS. Same as Anthropology 134. The morphology and physiology of the human body; emphasis on the interrelationships of the various organs and systems. Three lectures and 6 hours of laboratory per week. Prerequisite: BioS. 133.

193. HONORS BIOLOGY. 1 HOUR. Open only to freshmen, sophomores, and juniors. An additional hour of related work for students registered in a course in biological sciences. May be repeated for 1 hour each quarter. Prerequisites: James Scholar status or, for superior students, approval of the department, registration in a biological sciences course (except BioS. 299 or 300), and consent of the instructor.

200. HISTORY OF BIOLOGY. 3 HOURS. Major problems and suggested solutions from the earliest records to the present. Prerequisite: Four quarters of laboratory science.

201. TOPICS IN PLANT PHYLOGENY. 4 HOURS. Major events in the evolution of plants and selected aspects of current problems in plant phylogeny. Lecture and laboratory. Prerequisites: BioS. 100, 101, 102 or the equivalents.

202. ELEMENTARY PLANT PHYSIOLOGY. 5 HOURS. Translocation, photosynthesis, respiration and basic metabolism, plant growth hormones, and plant growth. Prerequisite: One year of biological sciences.

205. MICROTECHNIQUE. 5 HOURS. Various methods of preparing animal and plant tissue for microscopic examination. Includes techniques and basic theories related to differential staining, histochemistry, and light microscopy. Prerequisite: One year of biological sciences.

210. SELECTED IDEAS IN REGULATORY BIOLOGY. 4 HOURS. Topics are chosen to illustrate the basic unifying principles in the biological sciences; emphasis on processes of biological thought. Lecture and laboratory. Prerequisites: One year of biological sciences and senior standing or consent of the instructor.

211. SELECTED IDEAS IN EVOLUTIONARY BIOLOGY. 4 HOURS. Topics are chosen to illustrate the basic unifying principles in the biological sciences; emphasis on processes of biological thought. Lecture and laboratory. Prerequisites: One year of biological sciences and senior standing or consent of the instructor.

218. INTRODUCTION TO PALEONTOLOGY. 4 HOURS. Same as Geological Sciences 218. The phylogeny, morphology, and ecology of fossils; emphasis on the inverterbrates. Two or three Saturday field trips are required. Prerequisites: One year of biological sciences or GeolS. 103 and consent of the instructor.

220. PLANT TAXONOMY. 4 HOURS. Classification and identification of flowering plants; emphasis on local flora. Lecture, laboratory, and occasional field trips. Prerequisite: One year of biological sciences.

230. BIOLOGY OF NONVASCULAR PLANTS. 4 HOURS. Structure and function in representative algae, fungi, slime-molds, and bryophytes in relation to their life cycles and phylogeny. Lecture and laboratory. Prerequisite: One year of biological sciences.

232. PLANT GROWTH AND DIFFERENTIATION. 4 HOURS. The developmental sequences in respect to time, light, temperature, and nutrition of selected vascular and nonvascular plants. Lecture and laboratory. Prerequisite: One year of biological sciences.

235. BIOLOGY AND EVOLUTION OF HUMAN BEHAVIOR. 4 HOURS. Same as Anthropology 235. Comparative behavior of human and nonhuman primates; biological bases of primate behavior in terms of general evolutionary trends. Critical review of the analytic methodology of the behavioral sciences. Prerequisites: One year of biological sciences and Anth. 130 or consent of the instructor.

236. HUMAN GENETICS. 4 HOURS. 3 hours lecture; 1 hour quiz-discussion. Same as Anthropology 236. For nonmajors or students who are unprepared for Biological Sciences 240. Basic genetic principles applied to human heredity and diversity, family analysis, chromosomal and genic anomalies, and population, racial, and social variations. Prerequisites: Three quarters of biological sciences, Math. 130, and three quarters of chemistry.

240. GENETICS. 3 HOURS. No credit for biological sciences majors unless credit is also obtained for Biological Sciences 241. Same as Information Engineering 283. Principles of heredity and variation illustrating the gene concept, genic structure, and primary function in growth and development. Lecture and discussion. Prerequisite: 12 hours of biological sciences. One year of college mathematics or organic chemistry is recommended.

241. GENETICS LABORATORY. 2 HOURS. 6 hours per week in the laboratory. Same as Information Engineering 284. Experiments and demonstrations of heredity and variation using material from drosophila, corn, rodents, bacteria, fungi, and viruses. Prerequisite: Credit or concurrent registration in BioS. 240.

246. DRUGS IN OUR SOCIETY. 3 HOURS. No credit toward the major in biological sciences. Same as Pharmacognosy and Pharmacology 246 (Medical Center). Lecture-discussions expose the student to the scientific bases for drug action and abuse, enhance the ability to evaluate attitudes about drugs, and provide limited insight into the nature and validity of community drug knowledge. Prerequisite: One year of college biology.

250. GENERAL MICROBIOLOGY. 5 HOURS. Introduction to the principal activities and properties of microorganisms, emphasizing fundamental concepts. Lecture and laboratory. Prerequisites: One year of biological sciences and credit or registration in organic chemistry.

256. EXOBIOLOGY. 4 HOURS. Origin and early evolution of life systems in abiotic environments. Prerequisites: BioS. 250 and any one of BioS. 261, 275, 326, 366, or 370.

259. NEUROBIOLOGY. 3 HOURS. Same as Information Engineering 259. Introduction to basic anatomical and physiological concepts of the human central nervous system. Prerequisite: One year of biological sciences or consent of the instructor.

260. BIOLOGY OF HUMAN REPRODUCTION. 3 HOURS. No credit for biological sciences majors. The anatomy and physiology of the human reproductive system Lecture. Prerequisite: One year of biological sciences.

261. CELL PHYSIOLOGY I. 3 HOURS. The basic physiological activities common to cells. Similarities and differences in activity and control among diverse cell types. Lecture. Prerequisites: One year of general biology and Chem. 233. For biological sciences majors concurrent registration in BioS. 262 is also required. Chemistry 235 is recommended.

262. LABORATORY IN CELL PHYSIOLOGY I. 3 HOURS. Laboratory experiments in functional aspects of cellular activity, such as permeability and its control, cellular respiration, nucleic acids, photosynthesis. Modern methods and instrumentation are stressed. Prerequisite: Concurrent registration in BioS. 261.

275. ANIMAL PHYSIOLOGY. 4 HOURS. Survey of basic physiological mechanisms utilized by invertebrate and vertebrate animals in maintaining homeostasis in response to similar and diverse environments. Prerequisites: BioS. 100, 101, and 102.

280. VERTEBRATE MORPHOGENESIS. 5 HOURS. Same as Information Engineering 280. Introduction to vertebrate anatomy; emphasis on early embryology and histology. Lecture and laboratory. Prerequisite: One year of biological sciences.

281. STRUCTURE AND DEVELOPMENT OF VERTEBRATES I. 5 HOURS. Same as Information Engineering 281. With Biological Sciences 282, a two-quarter sequence. Evolution of vertebrate organ systems; their embryogenesis and microscopic and gross anatomy. Lecture and laboratory. Prerequisite: One year of biological sciences.

282. STRUCTURE AND DEVELOPMENT OF VERTEBRATES II. 5 HOURS. Same as Information Engineering 282. Continues Biological Sciences 281. Prerequisite: BioS. 281.

283. ORNITHOLOGY. 4 HOURS. Introduction to the study of birds; their anatomy, physiology, behavior, and relationships with their environment. Special attention is given to migration. Prerequisite: One year of biological sciences.

299. INDIVIDUAL TOPICS. 3 TO 5 HOURS. For qualified students who wish to carry out individual research problems. Laboratory, conferences, and assigned readings. Prerequisite: Junior standing, consent of a research adviser, and approval of the department.

300. SEMINAR. 0 TO 1 HOUR. Faculty and visiting biologists discuss results of their research programs before staff and students at weekly meetings. Biological sciences majors must enroll for two quarters in their senior year; one hour of credit will be given at the completion of the second quarter. Attendance of majors at all meetings is strongly encouraged. Prerequisites: Biological sciences major, junior standing.

303. QUANTITATIVE BIOLOGY I. 5 HOURS. Quantitative ideas and mathematical models in the development of biological theory and as a basis for biological experimentation. Lecture and laboratory. Prerequisites: Math. 131 and either BioS. 240 and 241 or BioS. 315.

304. CYTOLOGY LABORATORY. 3 HOURS. Advanced cytology; emphasis on instrumental methods. Prerequisites: BioS. 261 and concurrent registration in BioS. 309 or consent of the instructor.

305. QUANTITATIVE BIOLOGY II. 5 HOURS. Formal aspects of biological experimentation, including the basic aspects of experimental design; interpretation of biological data. Lecture and laboratory. Prerequisite: BioS. 303.

307. BIOLOGICAL METHODS FOR TEACHERS. 3 HOURS. Investigation of methodological subjects, conducted primarily as a practicum; emphasis on the development of competencies. Prerequisites: Senior standing and 40 hours of biological sciences.

309. CYTOLOGY. 3 HOURS. Structure and function of cells as revealed through historical development and modern research techniques. Lecture. Prerequisite: Two years of biological sciences.

313. DEVELOPMENTAL BIOLOGY. 4 HOURS. Principles governing growth and differentiation at molecular, fine structural, cellular, and organismic levels. Lecture and laboratory. Prerequisite: One year of biological sciences.

314. PLANT DEVELOPMENT. 5 HOURS. Analysis of growth in plants; modern concepts of cellular differentiation; control of plant development by intrinsic, hormonal, and environmental factors. Lecture and laboratory. Prerequisites: Chem. 234, BioS. 232, 313, or 333, and consent of the instructor.

315. PRINCIPLES OF ECOLOGY. 3 HOURS. Composition and distribution of biotic communities, plant and animal; emphasis on the interplay of physical and biological factors of the environment. Prerequisites: One year of biological sciences and concurrent registration in BioS. 324 or 380.

316. INVERTEBRATE PALEONTOLOGY. 4 HOURS. Same as Geological Sciences 316. Phylogeny, morphology, and ecology of the fossil invertebrates. Prerequisites: BioS. 218 and consent of the instructor.

317. COMMUNITY ECOLOGY. 5 HOURS. Concepts of trophic structure, niche, competition, coexistence, and diversity are used to examine theories of community origin, change, structural-functional patterns, and distribution; emphasis on experimental bases and current problems. Prerequisites: BioS. 315 and either 324 or 380.

318. VERTEBRATE PALEONTOLOGY. 4 HOURS. Same as Geological Sciences 318. Phylogeny, morphology, and ecology of the fossil vertebrates. Prerequisites: BioS. 281 and consent of the instructor.

319. PALEOBOTANY. 5 HOURS. Same as Geological Sciences 319. Structure, phylogeny, and stratigraphic distribution of representative fossil plants. Lecture, laboratory, and field trips. Prerequisite: One year of biological sciences.

320. FIELD BOTANY. 5 HOURS. Flora and vegetation of the Chicago region. Lecture, laboratory, and field trips. Prerequisite: One year of biological sciences.

321. PLANT GEOGRAPHY OF NORTH AMERICA. 4 HOURS. Ecological and systematic treatment of vegetation regions and principal subdivisions; emphasis on environmental factors and floras. Prerequisite: BioS. 220 or 315.

324. PLANT ECOLOGY LABORATORY. 2 HOURS. Special attention to vegetation and environment of the Chicago region. Laboratory and field trips. Prerequisite: Concurrent registration in BioS. 315.

325. PLANT ANATOMY. 4 HOURS. Examination of the internal structure of vascular plants; emphasis on structure and function. Lecture and laboratory. Prerequisite: One year of college biology or the equivalent.

326. PLANT PHYSIOLOGY I. 3 HOURS. Photobiology of photosynthesis, photosynthetic carbon metabolism, formation of the photochemical apparatus, and respiration. Prerequisites: One year of biological sciences and Chem. 234.

327. PLANT PHYSIOLOGY II. 3 HOURS. Water relations, translocation of solutes, growth, flowering, and phytohormones. Prerequisites: One year of biological sciences and Chem. 234.

328. PLANT PHYSIOLOGY LABORATORY I. 2 HOURS. Laboratory techniques. Prerequisite: Concurrent registration in BioS. 326.

329. PLANT PHYSIOLOGY LABORATORY II. 2 HOURS. Laboratory techniques. Prerequisite: Concurrent registration in BioS. 327.

330. PRIMATE EVOLUTION. 4 HOURS. Same as Anthropology 330. Paleontology and systematics of fossil primates as illuminated by the anatomy, ecology, and behavior of the living populations. Prerequisite: Anth. 231 or BioS. 282 or 318.

331. HUMAN EVOLUTION. 4 HOURS. Same as Anthropology 331. Phylogeny of the primate order and the problems of speciation; particular emphasis on the relative roles of culture and nature as selective forces in human evolution. Prerequisite: Anth. 230 or 231 or BioS. 282 or 318.

332. MORPHOGENESIS IN HIGHER PLANTS. 3 HOURS. Morphogenesis, growth, and differentiation of vascular plants and bryophytes. Emphasis on experimental approaches to plant development at the molecular, cellular, and organismic levels. Lecture. Prerequisites: Senior standing, Chem. 234, and BioS. 313 or 333.

333. MORPHOLOGY OF VASCULAR PLANTS. 4 HOURS. Structure reproduction, and evolutionary history of representative vascular plants, including psilopsids, lycopsids, sphenopsids, ferns, gymnosperms, and angiosperms. Lecture and laboratory. Prerequisite: One year of biological sciences.

342. CYTOGENETICS. 4 HOURS. Chromosomal phenomena involved in the mechanics of genetics, structure of genetic material, and the role chromosomal variation plays in the evolution of races and species. Lecture and laboratory. Prerequisites: BioS. 240 and 241.

343. POPULATION GENETICS. 3 HOURS. Genetic dynamics for animal, plant, and human populations: mating systems, selection, sampling, and mutation. Lecture and recitation. Prerequisites: Consent of the instructor or BioS. 240 and 241, Math. 130, and credit or concurrent registration in statistics.

344. EXPERIMENTAL POPULATION GENETICS. 3 HOURS. Discussion of experimental and field empirical studies estimating genetic parameters, influence of selection, and other evolutionary forces on genotypes in populations. Lecture, laboratory, and discussion. Prerequisite: BioS. 343.

345. SYSTEMATICS AND EVOLUTION. 4 HOURS. Mechanisms of genetic and phenotypic stability and change in populations and species; modes of speciation; rationale for classification systems; nature of taxonomic characters. Prerequisites: One year of biological sciences and BioS. 240, 241.

347. PHYSIOLOGICAL GENETICS. 4 HOURS. Consideration of heredity at the biochemical level; particular reference to mutation, the transcription and translation of genetic information, and genetic regulatory mechanisms. Lecture. Prerequisites: BioS. 240, 241, and 370.

349. EVOLUTIONARY THEORY. 3 HOURS. Analysis of evolutionary mechanisms in plants and animals; variation and differentiation in populations and species; origins of superspecific taxa. Prerequisites: BioS. 315 and 345.

350. ADVANCED MICROBIOLOGY. 5 HOURS. Modern contributions to the cellular anatomy, physiology, and genetics of microorganisms. Lecture and laboratory. Prerequisite: BioS. 250 or 261 or the equivalent.

351. PRINCIPLES OF CELL AND TISSUE CULTURE. 5 HOURS. Methods for primary isolation of plant and animal tissue and subsequent cultivation. Uses of cells in culture as experimental tools. Prerequisites: BioS. 250 and 261.

353. CHEMICAL BIOGENESIS. 4 HOURS. Same as Chemistry 353. Biosynthesis of important biological compounds. Lecture and discussion. Prerequisite: Chem. 134 or 234.

356. MYCOLOGY. 4 HOURS. Analysis of the morphology, physiology, and genetics of fungi, as related to the taxonomy and phylogeny of fungi. Lecture and laboratory. Prerequisite: One year of biological sciences.

359. NEUROANATOMY. 5 HOURS. Same as Information Engineering 359. Introduction to the neurological organization of the mammalian central nervous system. Prerequisites: BioS. 280 and consent of the instructor.

361. CELL PHYSIOLOGY II. 3 HOURS. Emphasizes the structural and functional interactions of cell organelles. Organelle development, physiology, and organization is considered, particularly in the context of current literature. Prerequisite: BioS. 261 or the equivalent.

362. LABORATORY IN CELL PHYSIOLOGY II. 2 HOURS. Practical experience with techniques and analytical methods in cell physiology at an advanced level. An experimental approach is emphasized. Prerequisite: BioS. 261 or the equivalent or consent of the instructor.

363. ANIMAL PHYSIOLOGY I. 5 HOURS. Same as Information Engineering 383. The role of the digestive, circulatory, respiratory, and osmoexcretory systems in the maintenance of organismic homeostasis. Emphasis on vertebrates. Lecture and laboratory. Prerequisite: BioS. 261.

364. ANIMAL PHYSIOLOGY II. 5 HOURS. Same as Information Engineering 384. The role of the muscular, sensory, nervous, and endocrine systems in the maintenance of organismic integration. Emphasis on vertebrates. Lecture and laboratory. Prerequisite: BioS. 261.

366. MICROBIAL PHYSIOLOGY I. 5 HOURS. Organization of physiological processes in various groups of microorganisms: comparative biochemistry of energy-yielding mechanisms; biosynthesis of macromolecules; ecological implications of microbial metabolism. Lecture, discussion, laboratory. Prerequisite: BioS. 250 or the equivalent.

368. VIROLOGY. 4 HOURS. Nature of viruses and their morphology. Chemical composition, assay, host-parasite interactions, and life cycles. Lecture, discussion. Prerequisite: BioS. 250 or 261.

370. BIOCHEMISTRY I. 4 HOURS. Same as Chemistry 350. Chemistry of biological systems, including proteins and enzymes. Prerequisites: Chem. 119 or 121 and credit or registration in Chem. 235.

371. BIOCHEMISTRY II. 4 HOURS. Same as Chemistry 351. Continues Biological Sciences 370. Carbohydrates and lipide metabolism. Electron transport. Prerequisite: BioS. 370.

372. BIOCHEMISTRY III. 4 HOURS. Same as Chemistry 352. Continues Biological Sciences 371. Metabolism of amino acids, nucleic acids, proteins, and the biosynthesis of biological macromolecules. Prerequisite: BioS. 371.

373. BIOCHEMISTRY III LABORATORY. 2 HOURS. Experiments in macromolecular biochemistry including cell fractionation, enzyme regulation, use of radioactive isotopes, and protein synthesis. Prerequisite: Concurrent registration in BioS. 372 or Chem. 352.

375. COMPARATIVE VERTEBRATE PHYSIOLOGY I. 4 HOURS. Comparison of selected physiological adaptations of various vertebrate groups to the factors of the environment at the whole animal and organ system levels. Lecture and laboratory. Prerequisite: BioS. 275 or BioS. 363 and 364 or the equivalent.

377. ENDOCRINOLOGY. 5 HOURS. Animal hormones in the control of integration, homeostasis, growth, and development. Lecture and laboratory. Prerequisite: BioS. 364.

380. ANIMAL ECOLOGY LABORATORY. 2 HOURS. Population and community assemblages of the Chicago region. Laboratory and field trips are required (one weekend trip plus field trips on Saturdays in the fall, Sundays in the spring). Prerequisite: Concurrent registration in BioS. 315.

381. ENVIRONMENTAL TOXICOLOGY. 5 HOURS. Ecological, physiological, health, and economic aspects of environmental toxicants. Lectures, laboratories, discussions, field trips. Prerequisite: BioS. 261 or 363 or the equivalent.

382. ENVIRONMENTAL CONSERVATION. 3 HOURS. Applied ecology of the use of renewable natural resources; special emphasis on biotic problems of land, water, and air management; pollution, population increase, multiple-use concept, and land ethics. Lecture and field trips. Prerequisites: BioS. 315 and either 324 or 380.

384. INVERTEBRATE ZOOLOGY I. 5 HOURS. Comparative study of structure, development, behavior, classification, and evolution of the lower invertebrate groups. Lecture and laboratory. Prerequisite: One year of biological sciences.

385. INVERTEBRATE ZOOLOGY II. 5 HOURS. Comparative study of structure, development, behavior, classification, and evolution of the higher invertebrate groups exclusive of arthropods. Lecture and laboratory. Prerequisite: BioS. 384 or consent of the instructor.

388. GENERAL ENTOMOLOGY. 5 HOURS. Introduction to the morphology, physiology, classification, behavior, and evolution of insects. It is recommended that students planning to take this course begin collecting insects the previous spring and summer. Lecture and laboratory. Prerequisite: 12 hours of biological sciences.

389. PRINCIPLES OF PROTOZOOLOGY. 5 HOURS. Introduction to the comparative morphology, physiology, and systematics of the protozoa, including discussion of advances in major areas of current research. Lecture and laboratory. Prerequisite: One year of biological sciences.

393. FUNCTIONAL ANIMAL MORPHOLOGY. 4 HOURS. Functional analysis of selected invertebrate and vertebrate organ systems applied to problems of comparative structure, adaptation, and phylogeny. Lecture and laboratory. Prerequisites: Senior standing and consent of the instructor.

395. ZOOGEOGRAPHY. 3 HOURS. Investigation of geological and biological factors leading to past and present distribution patterns of animals; emphasis on current experimental methods to elucidate mechansims of origin and diversification of island and continental faunas. Prerequisite: Senior standing.

397. ICHTHYOLOGY AND HERPETOLOGY. 5 HOURS. Ecology, speciation, and adaptive modifications of fishes, amphibians, and reptiles as demonstrated from experimental and descriptive studies. Prerequisite: Any one of BioS. 218, 240-241, 280, 281.

BLACK STUDIES (BlSt)

159. JAZZ LABORATORY ENSEMBLE. 1 HOUR. May be repeated for credit. Same as Music 159. Practical experience in the preparation and performance of jazz compositions and arrangements; improvisational procedures. Regular performances throughout the school year. Field trips may be required. Prerequisite: Consent of the instructor, determined by an audition.

165. AFRO AND LATIN AMERICAN CULTURES OF NORTH AMERICA. 4 HOURS. Same as Anthropology 165 and Latin American Studies 165. A synchronic and diachronic survey of the subcultures of minority populations in North America; emphasis on black and Latin American groups that have emerged in urban areas.

170. INTRODUCTION TO BLACK LITERATURE. 4 HOURS. Same as English 170. Broad study of the historical trends and influences on black literature from 1900 to the current development of a "black aesthetic"; emphasis on American literature.

180. SPEECH VARIATION IN URBAN AREAS I. 4 HOURS. Same as Speech and Theater 180. The development, causes, roles, and structure of urban speech variation; emphasis on black English. A lecture-laboratory approach to the aspects of multidialectical behavior; theories, styles, conflicts. Systematic examination of, and practice in, cross-cultural speech.

181. SPEECH VARIATION IN URBAN AREAS II. 4 HOURS. Same as Speech and Theater 181. The relationship of ethnolinguistics and aspects of cross-cultural communicative competence. Aspirational and attitudinal factors in language

maintenance. Conflicting value systems reflected in speech behavior. Examination of the concepts of superposed standard as a toll language and self-group identity in language interchange. Lecture-practicum. Prerequisite: BlSt. 180.

225. RACIAL AND CULTURAL MINORITIES. 4 HOURS. Same as Sociology 225. Sociological and social-psychological analysis of racial, religious, or other ethnic groups; consideration of some of the historical and current social problems resulting from their relationships in society. Prerequisite: Soc. 100.

257. AFRO-AMERICAN HISTORY TO THE SEVENTEENTH CENTURY. 4 HOURS. Same as History 257. West African origins of the American black population, the slave trade and seventeenth century slavery. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

258. AFRO-AMERICAN HISTORY FROM THE EIGHTEENTH CENTURY TO THE CIVIL WAR. 4 HOURS. Same as History 258. Afro-American slavery, black religion, black leadership, the black role in antislavery movements, the plantation and its way of life. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

259. AFRO-AMERICAN HISTORY SINCE THE CIVIL WAR. 4 HOURS. Same as History 259. The Reconstruction, black institutions and organizations, black labor, varieties of civil rights approaches and leaders thereof. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

286. HISTORY OF MINORITIES IN THE UNITED STATES: COLONIAL PERIOD THROUGH RECONSTRUCTION. 4 HOURS. Same as History 286. Racial, ethnic, religious, and political minorities in the United States. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

287. HISTORY OF MINORITIES IN THE UNITED STATES: RECONSTRUCTION TO THE PRESENT. 4 HOURS. Same as History 287. Racial, ethnic, religious, and political minorities in the United States. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

298. INDIVIDUAL STUDY: SPECIAL TOPICS. 4 HOURS. May be repeated for a maximum of 12 hours of credit. Selected topics for individual research. Prerequisite: Consent of the instructor and the Black Studies Program coordinator.

306. GHETTO POLITICS. 4 HOURS. Same as Political Science 306. Analysis of the political impact of the ghetto on local, state, and national political systems; the impotency of the ghetto voter; the ghetto politician; ghetto riots as political protest; the ghetto and presidential politics. Prerequisite: Three courses in political science, American history, or sociology or consent of the instructor.

370. STUDIES IN BLACK LITERATURE. 4 HOURS. May be repeated for a maximum of 12 hours. Same as English 370. Study of a theme, genre, movement, or author in black literature, with emphasis on American literature. Prerequisite: Senior standing or 12 hours of English or consent of the instructor. Black Studies 170 is recommended.

379. INTRODUCTION TO AFRO-FRENCH LITERATURE. 4 HOURS. Same as French 379. Selected prose and poetry of Sub-Sahara African Francophone literature. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

386. TOPICS IN RACE, ETHNIC, AND MINORITY HISTORY. 4 HOURS. May be repeated for credit. Same as History 386. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.

BUSINESS LAW (BLaw)

310. MANAGERIAL JURISPRUDENCE. 4 HOURS. Application of the legal function to business administration. Basic legal tools for business transaction and corporate operations; legal aspects of the major segments of business management. Prerequisite: Junior standing.

CHEMISTRY (Chem)

103. NATURAL SCIENCES–CHEMICAL EVOLUTION. 4 HOURS. Same as Natural Sciences 103. The architecture of matter: energy and the molecular basis of life and evolution.

110. PROBLEM SOLVING AND CONCEPTS IN CHEMISTRY. 3 HOURS. An individualized course in problem solving and mastery of the skills and concepts presumed in Chemistry 111. Prerequisites: Math. 170, 171, and recommendation of the department.

111. INTRODUCTION TO CHEMISTRY. 4 HOURS. For students without entrance credit in high school chemistry or inadequately prepared for Chemistry 112. Prerequisite: Satisfactory performance on a placement test.

112. CHEMICAL BONDING AND STRUCTURE. 5 HOURS. For students with one year of high school chemistry and adequate preparation, as shown by placement examination. Atomic and molecular structure; chemistry of the covalent and ionic bond. Prerequisite: Chem. 111 or adequate performance on the placement test.

113. EQUILIBRIA: CHEMISTRY OF SOLUTIONS. 5 HOURS. Acid-base reactions, solubility relations, oxidation potentials, qualitative analysis. Prerequisite: Chem. 112 or superior performance on the placement test or advanced placement or Chem. 117. College algebra or the equivalent is strongly recommended.

114. STRUCTURE AND REACTIVITY. 5 HOURS. Elementary thermodynamics and kinetics; electrochemistry. Prerequisite: Chem. 113 or advanced placement.

117. GENERAL AND ANALYTICAL CHEMISTRY I. 6 HOURS. Primarily for students in the chemistry, chemical engineering, and physics curricula and natural science majors. Prerequisite: Superior performance on the placement test.

118. GENERAL AND ANALYTICAL CHEMISTRY II. 6 HOURS. Continues Chemistry 117. Prerequisite: Chem. 117 with a grade of C or higher.

119. GENERAL AND ANALYTICAL CHEMISTRY III. 6 HOURS. Credit is not given for Chemistry 119 if the student has credit in 121. Continues Chemistry 118, with special emphasis on quantitative analysis. Prerequisite: Chem. 118.

121. ANALYTICAL CHEMISTRY. 5 HOURS. Credit is not given for Chemistry 121 if the student has credit in Chemistry 119. Volumetric, gravimetric and instrumental methods of analysis. Prerequisite: Chem. 114 or Chem. 113 and SysE. 150 or advanced placement.

132. ELEMENTARY ORGANIC CHEMISTRY. 5 HOURS. Primarily for prenursing students. This course does not satisfy the organic chemistry prerequisite for biochemistry or for advanced courses in organic chemistry. Prerequisite: Chem. 112.

232. ORGANIC CHEMISTRY I. 4 HOURS. Organic structure and synthesis and the mechanisms of organic reactions. Prerequisite: Chem. 114 or 119.

233. ORGANIC CHEMISTRY II. 4 HOURS. Continues Chemistry 232. Prerequisite: Chem. 232.

234. ORGANIC CHEMISTRY LABORATORY I. 1 HOUR. Introduction to the laboratory principles and techniques of organic chemistry. Prerequisites: Chem. 232 and concurrent registration in Chem. 233.

235. ORGANIC CHEMISTRY III. 4 HOURS. Continues Chemistry 233. Prerequisite: Chem. 233.

236. ORGANIC CHEMISTRY LABORATORY II. 1 HOUR. Continues Chemistry 234. Experiments on the properties of functional groups and in synthesis selected to illustrate fundamental principles and introduce new techniques. Prerequisites: Chem. 233 and 234.

237. ORGANIC CHEMISTRY LABORATORY III. 2 HOURS. Continues Chemistry 236. Prerequisite: Chem. 236.

281. ELEMENTS OF GLASS BLOWING. 1 HOUR. Demonstrations and practice in glass blowing and the construction of simple laboratory equipment. Prerequisites: Junior standing in chemistry and consent of the instructor.

282. CHEMICAL LITERATURE. 2 HOURS. Survey of chemical information sources and retrieval procedures. Prerequisites: 24 hours of chemistry and 16 hours of German or Russian or French or the equivalents.

285. HISTORY OF SCIENCE, WITH PARTICULAR REFERENCE TO CHEMISTRY. 3 HOURS. The historical development of leading ideas in science and chemistry. Prerequisite: 26 hours of laboratory science.

295. ENVIRONMENTAL CHEMISTRY. 3 HOURS. Underlying chemical and biochemical elements of atmospheric, land, and water pollution. Discussion of chemical pollutants and chemical reactions in the atmosphere, pesticides, food additives, industrial wastes, and natural toxins and their relation to land pollution; the role of phosphates and alternatives to them evaluated on the basis of chemical and biochemical factors. Prerequisite: Chem. 234.

314. INORGANIC CHEMISTRY. 4 HOURS. Lectures and assigned readings on the chemistry of selected elements. Prerequisite: Chem. 340.

315. INORGANIC CHEMISTRY. 4 HOURS. Lectures and assigned readings in structural inorganic chemistry, inorganic reaction mechanisms and techniques, and the nature of the coordinate bond. Prerequisite: Chem. 342 or the equivalent.

316. INORGANIC CHEMISTRY LABORATORY. 2 HOURS. Synthesis of inorganic compounds illustrating the use of modern preparative techniques. Prerequisite: Credit or registration in Chem. 315.

321. CHEMICAL AND INSTRUMENTAL ANALYSIS I. 5 HOURS. Chemical and instrumental methods of analysis and their application to the quantitative study of chemical reactions. Prerequisites: Chem. 235 and credit or registration in Chem. 343 or the equivalents.

322. CHEMICAL AND INSTRUMENTAL ANALYSIS II. 3 HOURS. Continues Chemistry 321. Prerequisite: Chem. 321.

327. APPLIED ANALYTICAL CHEMISTRY I. 5 HOURS. Same as Criminal Justice 314. Theory and procedures of separation, purification, and identification of components of industrial and forensic interest. Prerequisites: Chem. 121, 235, or CrJ. 211, 313 or consent of the instructor.

328. APPLIED ANALYTICAL CHEMISTRY II. 5 HOURS. Same as Criminal Justice 315. Advanced instrumental analytical procedures applied to substances of industrial and forensic interest. Prerequisite: Chem. 327 or CrJ. 314 or consent of the instructor.

338. SYSTEMATIC IDENTIFICATION OF ORGANIC COMPOUNDS. 3 HOURS. Primarily a laboratory course; chemical, physical, and spectroscopic methods are used to separate, purify, and identify organic compounds. Prerequisite: Chem. 237.

339. ORGANIC SYNTHESIS. 2 TO 4 HOURS. Discussion and laboratory work involving special techniques in organic synthesis. Prerequisite: Chem. 237 or the equivalent.

340. PHYSICAL CHEMISTRY I. 4 HOURS. Credit is not given for both the Chemistry 340, 342, 344 sequence and the 380, 382 sequence. Introduction to the study of chemical principles. Prerequisites: Chem. 119 or 121, credit or registration in Math. 133, and one year of college physics.

341. PHYSICAL CHEMISTRY LABORATORY I. 2 HOURS. Quantitative experimental study of chemical principles. Prerequisite: Concurrent registration in Chem. 340.

342. PHYSICAL CHEMISTRY II. 4 HOURS. Continues Chemistry 340. Prerequisite: Chem. 340.

343. PHYSICAL CHEMISTRY LABORATORY II. 3 HOURS. Continues Chemistry 341. Prerequisites: Chem. 341 and concurrent registration in Chem 342.

344. PHYSICAL CHEMISTRY III. 4 HOURS. Continues Chemistry 342. Prerequisite: Chem. 342.

345. PHYSICAL CHEMISTRY LABORATORY III. 2 HOURS. Continues Chemistry 343. Prerequisites: Chem. 343 and concurrent registration in Chem. 344.

347. INTRODUCTION TO QUANTUM CHEMISTRY. 4 HOURS. Application of quantum mechanics to problems of chemical interest. Additional assignments are required. Prerequisite: Chem. 344.

348. THERMODYNAMICS. 4 HOURS. Lectures and assigned readings; applications to chemical systems. Prerequisite: Chem. 344.

349. STATISTICAL THERMODYNAMICS. 4 HOURS. Introduction to statistical mechanics and application to equilibrium thermodynamics. Individual projects are required. Prerequisite: Chem. 344.

350. BIOCHEMISTRY I. 4 HOURS. Same as Biological Sciences 370. Chemistry of biological systems, including proteins and enzymes. Prerequisites: Chem. 119 or 121 and credit or registration in Chem. 235.

351. BIOCHEMISTRY II. 4 HOURS. Same as Biological Sciences 371. Continues Chemistry 350. Carbohydrate and lipide metabolism. Electron transport. Prerequisite: Chem. 350.

352. BIOCHEMISTRY III. 4 HOURS. Same as Biological Sciences 372. Continues Chemistry 351. Metabolism of amino acids, nucleic acids, proteins, and the biosynthesis of biological macromolecules. Prerequisite: Chem. 351.

353. CHEMICAL BIOGENESIS. 4 HOURS. Same as Biological Sciences 353. Biosynthesis of important biological compounds. Prerequisite: Chem. 234.

355. BIOCHEMISTRY LABORATORY I. 2 HOURS. Introduction to experimentation with biochemical systems, processes, and compounds of biochemical importance. Prerequisite: Registration in Chem. 350.

357. BIOCHEMISTRY LABORATORY II. 2 HOURS. Continues Chemistry 355. Prerequisites: Chem. 355 and registration in Chem. 351.

361. ADVANCED ORGANIC CHEMISTRY I. 4 HOURS. A physical-organic approach to organic reactions with particular emphasis on reaction mechanisms and the relationship between reactivity and structure. Lectures and assigned readings. Prerequisites: Chem. 235 and 344.

362. ADVANCED ORGANIC CHEMISTRY II. 4 HOURS. Continues Chemistry 361. Lectures and assigned readings. Prerequisite: Chem. 361.

380. PRINCIPLES OF PHYSICAL CHEMISTRY I. 4 HOURS. Credit is not given for both the Chemistry 380, 382 sequence and the 340, 342, 344 sequence. Chemistry 380 and 382 provide an elementary introduction to physical chemistry; particular emphasis on topics of importance in the biological and health sciences. Prerequisites: Chem. 119 or 121, calculus, and two quarters of physics, or consent of the instructor.

382. PRINCIPLES OF PHYSICAL CHEMISTRY II. 4 HOURS. Continues Chemistry 380. Prerequisite: Chem. 380.

383. ELEMENTARY PHYSICAL CHEMISTRY LABORATORY. 1 HOUR. An introductory laboratory course. Prerequisite: Chem. 380.

384. SURFACE AND MACROMOLECULAR CHEMISTRY. 4 HOURS. Interfacial phenomena, stability of disperse systems, properties of polymer solutions. Prerequisites: Chem. 382 or the equivalent and consent of the instructor.

385. SURFACE AND MACROMOLECULAR LABORATORY. 2 HOURS. Techniques in surface and macromolecular chemistry. Prerequisites: Credit or registration in Chem. 384 and consent of the instructor.

392. INDEPENDENT STUDY. 1 TO 4 HOURS. May be repeated for credit. Individual study, under the close supervision of a faculty member, in areas not covered in standard courses. Credit is contingent on the submission of a written report to both the supervisor for approval and the Department of Chemistry for information. A maximum of 8 hours of Chemistry 392 and 399 combined may be credited toward departmental undergraduate-degree course requirements. Prerequisites: Approval of the department and consent of the instructor.

393. TOPICS IN MODERN CHEMISTRY. 2 TO 4 HOURS. Lectures, demonstrations, and discussions, in specialized areas of chemistry, including analytical, inorganic, organic, and physical chemistry and biochemistry. Prerequisite: Consent of the instructor.

399. INDEPENDENT RESEARCH. 3 HOURS OR MORE. May be repeated for credit. Individual research performed under the close supervision of a faculty member. Credit is contingent on the submission of a written report to both the supervisor for approval and the Department of Chemistry for information. A maximum of 8 hours of Chemistry 392 and 399 combined may be credited toward departmental undergraduate-degree course requirements. Prerequisites: Approval of the department and consent of the instructor.

CHINESE (Chin)

101. ELEMENTARY CHINESE I. 4 HOURS. Four additional half hours per week in the language laboratory. Reading, grammar, and simple oral practice.

102. ELEMENTARY CHINESE II. 4 HOURS. Four additional half hours per week in the language laboratory. Prerequisite: Chin. 101 or the equivalent.

103. ELEMENTARY CHINESE III. 4 HOURS. Four additional half hours per week in the language laboratory. Prerequisite: Chin. 102 or the equivalent.

104. INTERMEDIATE CHINESE I. 4 HOURS. Reading of Chinese texts; emphasis on Chinese history. Prerequisite: Chin. 103 or the equivalent.

105. INTERMEDIATE CHINESE II. 4 HOURS. Continues Chinese 104. Continued reading; emphasis on Chinese geography. Prerequisite: Chin 104 or the equivalent.

106. INTERMEDIATE CHINESE III. 4 HOURS. Continues Chinese 105. Continued reading; emphasis on newspapers and selected articles in the Chinese language. Prerequisite: Chin. 105 or the equivalent.

CLASSICS (Cl)

104. THE TRADITION OF WESTERN LITERATURE OF THE ANCIENT WORLD. 4 HOURS. Same as Humanities 104. Primarily for students not majoring in English or other languages. Selected masterpieces of poetry, drama, and fiction of the ancient world.

184. GREEK ATHLETICS. 4 HOURS. Survey of ancient athletics and its place in the educational system of the classical world.

201. TERMINOLOGY OF THE HEALTH SCIENCES. 2 HOURS. May be repeated for a maximum of 4 hours. The structure and formation of technical terms used in the health sciences based on roots and terms borrowed from Greek and Latin.

202. THE ANCIENT WORLD: GREECE TO THE AGE OF ALEXANDER. 4 HOURS. Same as History 202. Development of Greek civilization from the Helladic to Hellenistic periods. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

203. THE ANCIENT WORLD: ROME. 4 HOURS. Same as History 203. Development of Roman civilization from the eighth century B.C. to the fall of the Roman Empire. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

248. MYTHOLOGY OF GREECE. 4 HOURS. Same as Humanities 248 and Religious Studies 248. Intensive study of the gods and heroic sagas of the Greeks, through original sources in translation.

249. GREEK TRAGIC DRAMA IN TRANSLATION. 4 HOURS. Same as Humanities 249. Knowledge of Greek is not required. The plays of Aeschylus, Sophocles, Euripides. Prerequisite: Junior standing or consent of the instructor.

251. GREEK POETRY IN TRANSLATION. 4 HOURS. Same as Humanities 251. Knowledge of Greek is not required. Classical Greek poetry from its beginnings to the Byzantine period.

252. ROMAN SATIRE. 4 HOURS. Same as Humanities 252. Knowledge of Latin is not required. Selections from Horace, Persius, Petronius, Seneca, Martial, and Juvenal.

253. THE INTELLECTUAL DEVELOPMENT OF GREECE. 4 HOURS. Same as Humanities 253. Knowledge of Greek is not required. Selections from the philosophers, poets, historians, and scientists. Prerequisite: Junior standing.

254. GREEK COMEDY IN TRANSLATION. 4 HOURS. Same as Humanities 254. Knowledge of Greek is not required. The plays of Aristophanes and Menander. Prerequisite: Junior standing or consent of the instructor.

255. ROMAN COMEDY IN TRANSLATION. 4 HOURS. Same as Humanities 255. Knowledge of Latin is not required. The plays of Plautus and Terence. Prerequisite: Junior standing or consent of the instructor.

256. GREEK AND ROMAN EPIC POETRY. 4 HOURS. Same as Humanities 256. Knowledge of Greek and Latin is not required. The epic poems of Homer, Lucretius, Vergil, and others in the Greco-Roman tradition. Prerequisite: Junior standing or consent of the instructor.

257. CLASSICAL GREEK LITERATURE. 4 HOURS. Same as Humanities 257. Survey of ancient Greek literature with readings from representative classic texts. Prerequisite: Junior standing or approval of the department.

258. CLASSICAL ROMAN LITERATURE. 4 HOURS. Survey of ancient Roman literature with readings from representative classical texts.

259. CLASSICAL LITERARY CRITICISM. 4 HOURS. Same as Humanities 259. Examination of the primary extant sources of literary criticism: Aristotle, *Poetics*; Horace, *Ars Poetica;* Pseudo-Longinus, *On the Sublime;* Quintilian, *Institutio Oratoria.* Knowledge of Greek or Latin is helpful but not essential. Prerequisite: Junior standing.

272. GREEK RELIGION. 4 HOURS. Same as Religious Studies 272. Greek religious practice and thought from Mycenean to Hellenistic times.

279. INTRODUCTION TO CLASSICAL ARCHAEOLOGY. 4 HOURS. Materials and form of classical sites and the cultural remains associated with them; techniques of excavation and recovery. Prerequisite: Junior standing or consent of the instructor.

280. MONUMENTS AND INSTITUTIONS OF ATHENS. 4 HOURS. Same as History 205. The monuments of Athens as they relate to the political and social institutions of the fifth century B.C. Prerequisite: Junior or senior standing.

281. MONUMENTS AND INSTITUTIONS OF ROME. 4 HOURS. Same as Humanities 281. The political and social institutions of Rome as they relate to the major monuments during the first two centuries of the empire.

282. ROMAN RELIGION. 4 HOURS. Same as Humanities 282 and Religious Studies 282. Beliefs, practices, and institutions from the early republic to 476 A.D.

290. URBAN CRISES: ATHENS AND ROME. 4 HOURS. The response of two centers of antiquity to the problems and challenges of metropolitan communities. Ancient theories and texts on urban development. Prerequisite: Junior or senior standing.

299. INDEPENDENT READING. SPECIAL TOPICS IN CLASSICS IN TRANSLATION. 4 HOURS. May be repeated for credit. Individual study under faculty direction. Papers on chosen topics for qualified students based on preparation and interest; students must confer with faculty on papers.

348. MYTHOLOGY IN ROME. 4 HOURS. The conscious assimilation of Greek myth in Rome; investigation of the concept of myth. Prerequisite: Cl. 248.

349. CLASSICAL RHETORICAL TRADITION. 4 HOURS. Development of rhetorical tradition from its beginnings in ancient Greece to the Renaissance. Chief emphasis on the rhetorical works of Plato, Aristotle, Cicero, and Quintilian. Prerequisites: Junior standing and consent of the instructor.

CRIMINAL JUSTICE (CrJ)

101. ADMINISTRATION OF CRIMINAL JUSTICE. 4 HOURS. The development and contemporary operation of the agencies of criminal justice, from police procedures through the prosecution and judiciary, to correctional institutions, including probation and parole. Emphasis is on current philosophies and practices.

102. FOUNDATIONS OF CRIMINAL JUSTICE. 4 HOURS. The development of law as a means of social control, from earliest records through Hammurabi, the Greek and Roman civilizations, European cultures, Anglo-Saxon Britain, and the

common law to the present constitutional, statutory, and case law controls in the United States.

103. THE DEVELOPMENT OF POLICE SYSTEMS IN SOCIETY. 4 HOURS. Historical development of law enforcement, from earliest beginnings through Anglo-Saxon England to the present systems and operations. Comparative study of the theories and operations of police systems throughout the world. The structure and interrelationships of American police agencies on the federal, state, county, and municipal levels.

205. RESEARCH METHODOLOGY IN CRIMINAL JUSTICE I. 4 HOURS. Introduction to research in criminal justice. Research papers illustrating important areas of interest are analyzed. Prerequisites: CrJ. 101 and 102 or consent of the instructor.

206. RESEARCH METHODOLOGY IN CRIMINAL JUSTICE II. 4 HOURS. Continues Criminal Justice 205. Emphasis on practical problems associated with the analyses of experimental data. Laboratory practice in data analysis. Prerequisite: CrJ. 205.

210. CRIMINALISTICS. 4 HOURS. Operations undertaken in a crime laboratory to examine and evaluate evidence in criminal and civil investigations; firearms and tool identification, drug and narcotics analyses, serology, microscopy of trace materials, and forensic instrumental analyses. Prerequisite: CrJ. 259 or consent of the instructor.

211. INTRODUCTORY CRIMINALISTICS ANALYSIS LABORATORY. 5 HOURS. Introduction to laboratory analysis as applied to basic concepts of identification and individualization of common frequently occurring physical evidence materials. Criteria for the opinion formulation process. Prerequisites: Chem. 121, 134, Phys. 102, and CrJ. 210 or consent of the instructor.

212. FORENSIC SCIENCE. 4 HOURS. Introduction to the diverse fields of forensic science: pathology, toxicology, criminal psychology, detection of deception, and document examination; role of the sciences in the administration of criminal justice; examination of the current approaches to the identification of criminal homicide. Prerequisite: CrJ. 210 or consent of the instructor.

220. INFORMATION AND COMMUNICATION SYSTEMS. 4 HOURS. Review of the available technology in the communication and information fields; assessment of the introduction and application of scientific "hardware" and "software" to the administration of criminal justice at all levels. Historical development of communication and information systems in law enforcement. Prerequisite: CrJ. 258 or consent of the instructor.

230. SOCIOLOGY OF DEVIANCE. 4 HOURS. Same as Sociology 230. The substantive topic of deviant behavior and the various theoretical orientations advanced to explain it. Prerequisite: Soc. 100.

231. CRIMINOLOGY. 4 HOURS. Same as Sociology 231. The nature and extent of crime in American society; assessment and evaluation of the various factors and influences that lead to criminal behavior; various measures proposed for the control of criminal behavior. Prerequisite: CrJ. 230.

232. JUVENILE DELINQUENCY. 4 HOURS. Same as Sociology 232. Various conceptions of the nature of juvenile delinquency and its causes; the

juvenile-court movement; juvenile detention, treatment of juvenile offenders; delinquency control programs. Prerequisite: CrJ. 230.

258. POLICE ADMINISTRATION. 4 HOURS. The principles of administration and management in their application to law enforcement; the police organizational structure. Responsibilities and interrelationships of administrative and line-and-staff services. Analysis of the functional divisions of a modern police operation in its application to public-safety needs of the community. Prerequisites: CrJ. 101 and 102 or consent of the instructor.

259. PRINCIPLES OF CRIMINAL INVESTIGATION. 4 HOURS. Theory and practice of investigation; the possible applications of the philosophical principles of deductive and inductive reasoning to criminal investigation. The scientific fact-finding approach in the development of factual data from persons and things. The development and practice of criminal investigation in the field of law enforcement. Prerequisite: CrJ. 101 or consent of the instructor.

280. THEORIES OF SANCTIONS, DETERRENTS, AND REHABILITATION. 4 HOURS. Analytical examination of the historical philosophies and practices of sanctions for criminal acts. Evaluation of modern approaches to the disposition of offenders, including sentencing, capital punishment, incarceration, fines, and rehabilitation programs. Prerequisite: Junior standing or consent of the instructor.

313. ADVANCED CRIMINALISTICS ANALYSIS LABORATORY. 5 HOURS. Continues Criminal Justice 211. Covers more advanced concepts of identification and individualization, including the examination of less frequently encountered physical evidence materials and empirical data requirement for interpretation of examinations. Prerequisites: CrJ. 210 and 211 or consent of the instructor.

314. APPLIED ANALYTICAL CHEMISTRY I. 5 HOURS. Same as Chemistry 327. Theory and procedures of separation, purification, and identification of components of industrial and forensic interest. Prerequisites: Chem. 121, 235 or CrJ. 211, 313 or consent of the instructor.

315. APPLIED ANALYTICAL CHEMISTRY II. 5 HOURS. Same as Chemistry 328. Advanced instrumental analytical procedures applied to substances of industrial and forensic interest. Prerequisite: Chem. 327 or CrJ. 314 or consent of the instructor.

333. SOCIOLOGY OF LAW. 4 HOURS. Same as Sociology 333. The origin and development of legal norms in various social settings; their relationship to custom and incorporation in legal and quasi-legal institutions; special attention to the difference between legal and sociological reasoning; law as an instrument of social change. Prerequisite: 8 hours of upper-division sociology, including Soc. 230 or CrJ. 230, or consent of the instructor.

335. ORGANIZED CRIME IN THE UNITED STATES. 4 HOURS. The development of organized crime throughout history; detailed consideration of the political, social, and economic conditions involved in the appearance, spread, and expansion of organized crime in America. Prerequisites: CrJ. 101, 102, and 230 or consent of the instructor.

339. INSTITUTIONAL TREATMENT OF OFFENDERS. 4 HOURS. The role of the custodial and correctional institutions in the treatment of the offender; philosophy of administration and management of institutions; survey of historical development and current trends in jails and prisons. Prerequisites: CrJ. 101, 102 or consent of the instructor.

340. CRIMINAL SELF AND CRIMINAL CAREERS. 4 HOURS. The development of criminal self-conceptions; social-psychological processes of group alienation; development of commitment and professionalization in the development of criminal careers. Selected case studies. Prerequisites: Soc. 100, CrJ. 231 or consent of the instructor.

345. COMMUNITY TREATMENT OF OFFENDERS. 4 HOURS. The history and development of programs relating to community treatment of offenders; examination of the philosophies and programs dealing with the rehabilitation and reintegration of the offender into society. Prerequisites: CrJ. 101 and 102, Soc. 225 and 276, or consent of the instructor.

350. THE ROLE OF LAW ENFORCEMENT IN COMMUNITY RELATIONS. 4 HOURS. Analysis of the relationship between law enforcement and the social structure of the community, including an examination of the significant problem areas involving minority elements, cultural and ethnic groups, power and social-elite and political and social-action movements. Prerequisites: CrJ. 101, 102, Soc. 225 or 276 or consent of the instructor.

351. CRIMINAL LAW I: SUBSTANTIVE CRIMINAL LAW. 4 HOURS. Required in the curriculum of criminal justice; cannot be substituted for a criminal law course taken by law students. General doctrines of criminal liability in the United States; classification of crimes as against persons, property, and the public welfare. Emphasis on the concept of governmental sanctions of the conduct of the individual. Prerequisites: CrJ. 101 and 102 or consent of the instructor.

352. CRIMINAL LAW II: CRIMINAL PROCEDURE. 4 HOURS. Required in the curriculum of criminal justice; cannot be substituted for a criminal law course taken by law students. The criminal process. Legal problems associated with the investigation of crime, the acquisition of evidence, the commencement of a criminal proceeding, the prosecution and defense of charges, sentencing and appeal. Principal concern is with the development of existing procedures and examination of current efforts for reform. Prerequisite: CrJ. 351 or consent of the instructor.

353. CRIMINAL LAW III: THE INSTRUMENTALITIES OF CRIMINAL JUSTICE. 4 HOURS. Required in the curriculum of criminal justice; cannot be substituted for a criminal law course taken by law students. Continues Criminal Justice 352. Examination of the agencies which play significant roles in the criminal process. Functions of the law enforcement agency, counsel, and the courts. Particular emphasis on the responsibilities and interrelationships of the agencies examined. Prerequisite: CrJ. 352 or consent of the instructor.

354. EVIDENCE. 4 HOURS. The rules of evidence as they apply to judicial proceedings and administrative hearings relative to the criminal process. Development of the underlying rationale of the rules. Emphasis on the relationship between methods of evidence collection and admissibility. Prerequisite: CrJ. 352 or consent of the instructor.

360. INDUSTRIAL AND COMMERCIAL SECURITY ADMINISTRATION. 4 HOURS. Theories and philosophy of the administration of industrial and commercial security functions; survey of contemporary organization and management of security operations; application of law enforcement principles within private enterprise. Prerequisites: CrJ. 103, 258, and 259 or consent of the instructor.

391. PROSEMINAR IN CRIMINAL JUSTICE. 4 HOURS. Study in depth of current issues, problems, and developments of serious concern within the field of the administration of criminal justice. Prerequisites: CrJ. 101, 102 and junior standing or consent of the instructor.

398. THE PROBLEM OF JUSTICE. 4 HOURS. Same as Political Science 398. The premodern view of justice, such as Plato's or Aristotle's; the modern understanding of justice, such as Hobbes' or Locke's, which is the foundation of the modern political regime; Rousseau's seminal political thought on justice, which is the basis of a variety of reforms and alternatives offered to Hobbes' and/or Locke's political regime. Prerequisite: Two courses in political science including PolS. 150 or 151.

399. INDEPENDENT STUDY. 2 TO 8 HOURS. For criminal justice majors only. Independent study and research, under the direct supervision of a faculty member, on a subject or subjects not covered in the regular curriculum. Prerequisites: Consent of the instructor obtained by preregistration in the department office; at least five criminal justice courses, including CrJ. 101, 102, 205, and 206.

ECONOMICS (Econ)

120. PRINCIPLES OF ECONOMICS I. 4 HOURS. The elements of economic analysis: concepts of economy, market organization, price determination and function.

121. PRINCIPLES OF ECONOMICS II. 4 HOURS. The elements of economic analysis, continued: determination of the level of economic activity; the effect of monetary and fiscal policies on economic activity levels. Applications to economic policy. Prerequisite: Econ. 120.

320. MACROECONOMIC THEORY. 4 HOURS. Principles of national income accounting, determination of aggregate income and employment, the monetary system in relation to income and employment, short-term income fluctuations, long-term income growth. Prerequisite: Econ. 121.

321. MICROECONOMIC THEORY. 4 HOURS. Operation of individual markets, market structure, theory of the firm, theory of production, demand theory, general equilibrium and welfare economics. Prerequisite: Econ. 121.

322. MANAGERIAL ECONOMICS. 4 HOURS. Application of economic theory to decision making in the business firm. Demand and cost analysis, including demand forecasts; price policy of the individual firm; capital budgeting; production analysis; uses of operations research methods. Prerequisite: Econ. 321.

323. BUSINESS CONDITIONS ANALYSIS. 4 HOURS. Application of economic theory to analysis of changes in aggregate income and employment; quantitative economic models and their uses in the prediction of aggregate and more refined levels of business activity. Prerequisite: Econ. 320.

324. ECONOMIC HISTORY OF THE UNITED STATES. 4 HOURS. Growth of the American economy from colonial times to the present; special emphasis on contributing forces and factors. Prerequisites: Econ. 121 and 8 hours of social sciences.

325. ECONOMIC HISTORY OF EUROPE. 4 HOURS. Evolution of the economic institutions of Europe, beginning with the origins of capitalism; the development of industry, commerce, transportation, finance, and labor. Prerequisites: Econ. 121 and 8 hours of social sciences.

326. HISTORY OF ECONOMIC THOUGHT. 4 HOURS. Examination of the evolution of positive and normative economics from the sixteenth to the nineteenth century. Prerequisites: Econ. 121 and 9 hours of social sciences.

327. COMPARATIVE ECONOMIC SYSTEMS. 4 HOURS. Description and analysis of the normative and positive characteristics of capitalism, fascism, democratic socialism, and communism. Prerequisites: Econ. 121 and 8 hours of social sciences.

328. GOVERNMENT FINANCE. 4 HOURS. Government finance at the federal, state, and local levels, including government expenditures; principles of taxation; fiscal policy; government borrowing and the national debt; intergovernmental fiscal relations. Prerequisite: Econ. 321.

329. INDUSTRIAL ORGANIZATION. 4 HOURS. The structure of markets; behavior of firms within the market environment; measures of industrial concentration; economics of scale; mergers and the merger movement; price discrimination and tie-in sales; monopoly and cartel arrangements; resale price maintenance; innovation and technological change. Prerequisite: Econ. 321.

330. GOVERNMENT AND BUSINESS. 4 HOURS. The rationale and the mechanisms of the social control of business; the effects of government action in influencing the behavior of business firms; the procompetitive policy embodied in the Sherman Act and related legislation. Prerequisite: Econ. 321.

331. LABOR ECONOMICS. 4 HOURS. Economic problems and issues of trade union organization and wage theory; job security, hours, working conditions, labor legislation, unemployment. Prerequisite: Econ. 320 or 321.

332. URBAN ECONOMICS. 4 HOURS. Survey of economic problems of cities; the nature and function of cities; the demand for and supply of housing and urban land; the implications of location theory for the spatial pattern of cities; the impact of government programs. Prerequisites: Econ. 121 and 8 hours of social sciences.

333. INTERNATIONAL ECONOMICS. 4 HOURS. The balance of payments; fixed, flexible, and multiple exchange rates; the forward exchange market; the international trade multiplier; the transfer problem; capital flows; the law of comparative advantage; the gains from trade; tariffs and subsidies; the factor price equalization theorem; international economic communities. Prerequisite: Econ. 320 or 321.

334. ECONOMIC DEVELOPMENT. 4 HOURS. Same as Latin American Studies 334. Basic problems and characteristics of underdeveloped countries; classical, neoclassical, and modern contributions to the theory of development; major proposals for accelerating development; basic approaches to economic development; laissez-faire, interventionism; role and methods of planning; foreign aid; and economic integration. Prerequisite: Econ. 320 or 321.

335. ECONOMETRICS. 4 HOURS. Specification of economic models; measurement of variables; estimation of economic relationships and testing of economic hypotheses; single equation problems in estimation; introduction to simultaneous equation estimation. Prerequisites: Econ. 320 and 321 or consent of the instructor.

336. INTRODUCTION TO MATHEMATICAL ECONOMICS. 4 HOURS. Application of mathematics to theories of consumer and producer behavior, to the determination of prices in markets, and to growth and stability features of macroeconomic models. Prerequisites: Econ. 320, 321, Math. 110 and 112.

390. SPECIAL TOPICS IN ECONOMICS. 4 HOURS. Exploration of an area not covered in existing course offerings, or study in greater depth, or at a more advanced level, of a problem or subject that is covered in an existing course. Subject matter, and sometimes the prerequisites, will vary from quarter to quarter; prior to registration students should consult the department secretary for further information. Prerequisites: Senior standing and 15 hours of 300-level economics courses.

399. INDEPENDENT STUDY IN ECONOMICS. 2 TO 5 HOURS. May be repeated once for credit. For students who wish to do independent study in an area not covered by existing course offerings or to explore in greater depth a problem or subject covered in a previously taken course. Prerequisites: 15 hours of 300-level courses in economics and consent of both a faculty member and the head of the department.

EDUCATION (Ed)

Note: Classroom observation and/or related field experiences in the public schools are required of all students enrolled in each education course.

170. EDUCATIONAL FOUNDATIONS. 4 HOURS. The philosophical, historical, and social forces influencing current issues and practices in American education; their relevance in understanding the role of the teacher. Prerequisites: Psch. 100 and 60 hours of credit in any field.

201. FUNDAMENTALS OF HEALTH EDUCATION FOR THE ELEMENTARY SCHOOL TEACHER. 3 HOURS. The procedures and techniques for meeting the health needs and health education of the elementary school child; emphasis on

202. HEALTH OF PRESCHOOL CHILDREN. 4 HOURS. Prenatal and postnatal care of both mother and child; the health needs of new families and their preschool children; growth and development, common diseases, nutrition, resources, and means of access to health services. Prerequisite: Ed. 201 or 205, junior standing, or employment in day care facilities.

205. FUNDAMENTALS OF HEALTH EDUCATION FOR PHYSICAL EDUCATION TEACHERS. 3 HOURS. Preparation of physical education teachers in health education subject matter, methods, and special health counseling. Selected topics: human sexuality and the family; mental health in the schools; behavior involving drugs and alcohol; consumer health protection.

210. THE EDUCATIVE PROCESS. 4 HOURS. An interdisciplinary study of the biosocial and psychological factors influencing learning processes; application of

behavioral science knowledge to understanding the individual learner in the educative process.

221. CHILDREN'S LITERATURE. 4 HOURS. A survey from the seventeenth century to the present. Emphasis on the classics and present-day literature; methods of selection; using literature with children.

230. CURRICULUM AND INSTRUCTION IN THE SECONDARY SCHOOL. 4 HOURS. Basic principles of curriculum development, organization of learning experiences, the basic concepts of teaching. Application of the principles prepares the student for responsibilities in curriculum planning and classroom instruction in his fields of specialization. Prerequisite: Ed. 210.

231. MODELS OF METROPOLITAN HIGH SCHOOLS. 4 HOURS. Note: One of Education 231, 232, 233 may be taken in lieu of Education 230. Five selected secondary schools in the metropolitan Chicago area, representing different models of secondary education, are analyzed on six constructs. Comparisions of these models are based on data gathered from on-site visits. One scheduled day per week must be open for school visits. Prerequisites: Ed. 210, concurrent registration in Ed. 250 or consent of the instructor.

232. HUMANISTIC APPROACHES TO SECONDARY EDUCATION. 4 HOURS. Note: One of Education 231, 232, 233 may be taken in lieu of Education 230. A man-centered, affective approach to curriculum and instruction for prospective high school and junior high school teachers; emphasis on the humanities. Uses of the humanities as motivational and growth elements in teaching secondary school students. Prerequisite: Ed. 210.

233. SOCIAL INQUIRY IN SECONDARY EDUCATION. 4 HOURS. Note: One of Education 231, 232, 233 may be taken in lieu of Education 230. An interdisciplinary approach to classroom strategies used in the teaching of controversial issues in secondary schools. Classroom forums which create a climate for social analysis of controversial topics are stressed. Prerequisite: Ed. 210.

235. CURRICULUM, INSTRUCTION, AND EVALUATION I. 4 HOURS. Active investigation of the general dynamics of curriculum development at the elementary school level; special emphasis on research and synthesis in developing and coordinating the classroom experience. Prerequisites: Ed. 170 and 210.

236. CURRICULUM, INSTRUCTION, AND EVALUATION II. 4 HOURS. Development of the topics and concepts introduced in Education 235. Investigation and practicum in curriculum, instruction, and evaluation. Designs for instruction in elementary schools; emphasis on social studies. Prerequisite: Ed. 235.

237. CURRICULUM, INSTRUCTION, AND EVALUATION III. 4 HOURS. Amplification of the topics and concepts developed in Education 235 and 236. Investigation and practicum in curriculum, instruction, and evaluation in elementary schools; emphasis on science and communications. Prerequisite: Ed. 236.

241. BICULTURAL EDUCATION: SPANISH SPEAKING. 4 HOURS. Same as Latin American Studies 241. Sociology of how people who have experienced discrimination learn; psychology and sociology of racial prejudice; the industrial

city and minority groups; subculture and contraculture and their relationship to the educative process.

242. BICULTURAL EDUCATION: COMPARATIVE STUDY. 4 HOURS. Same as Latin American Studies 242. Cultural matrix of the bilingual child. Comparative study of Mexican-American, Puerto Rican, and United States cultural patterns of family, stratum and status, role of the teacher, and verbal and nonverbal communication.

243. CULTURAL MATRIXES OF THE SPANISH-SPEAKING CHILD. 4 HOURS. Same as Latin American Studies 243. One-quarter survey of Puerto Rican cultural patterns; special attention to the formation of Puerto Rican culture. The colonial heritage of Spanish and indigenous societies in the formation of modern Puerto Rico. Special attention to Puerto Rican institutional development in its relationship to the forces that determine a national character throughout the Hispanic colonial world; the relevance of the resulting institution is stressed. Prerequisite: Proficiency in Spanish.

244. PUERTO RICO: SOCIAL CHARACTER AND SOCIAL STRUCTURE FOR EDUCATORS. 8 HOURS. Same as Latin American Studies 244. Intensive study of the cultural vectors determining the character and the history of the Puerto Rican people; emphasis on the interrelationship between culture and education. Prerequisite: Proficiency in Spanish.

245. CREATIVE TEACHING IN ELEMENTARY SCHOOLS. 4 HOURS. Exploration of the principles and processes of creativity; emphasis on implications and applications for creative teaching. A creative approach to curriculum planning; content of curriculum areas, teaching, and learning are stressed. Prerequisites: Ed. 221, 235, Art 204, Mus. 250, and PE 280.

247. CURRICULUM FOR BILINGUAL-BICULTURAL TEACHERS. 4 HOURS. A socio-cultural examination of the problems of the Spanish-speaking migrant as they relate to present curriculum issues. Emphasis on a critical evaluation of present curricular practices and their impact on the Spanish child in urban schools. Prerequisites: Ed. 242 and 243.

248. HISTORY OF SPANISH-SPEAKING MINORITY GROUPS FOR URBAN EDUCATORS. 4 HOURS. Same as Latin American Studies 248. A one-quarter survey of the historical roots of the educational experiences and attitudes of Spanish-speaking minority groups. Prerequisite: Junior standing.

249. GEOGRAPHICAL ORIGINS OF SPANISH-SPEAKING MINORITY GROUPS IN URBAN EDUCATION. 4 HOURS. Same as Latin American Studies 249. A one-quarter survey of Latin-American educational patterns as they affect the urban school experiences of Spanish-speaking minority groups. A comparison of the American Indian and the Mediterranean attitudes toward school participation, especially in urban schools of the United States. Prerequisite: Junior standing.

250. EDUCATIONAL EVALUATION. 4 HOURS. Theories and methods of evaluation: the assessment of individuals, groups, and educational institutions in the attainment of educational objectives. Prerequisite: Credit or concurrent registration in Ed. 230 and/or Ed. 235.

261. FUNDAMENTALS OF READING INSTRUCTION. 4 HOURS. The effect of language and experience on reading instruction; the developmental 230 or 235.

262. IMPROVING READING IN THE PRIMARY GRADES. 4 HOURS. In-depth study of readiness and beginning reading, relationship of reading to child development, and development of decoding skills. 10 hours of supervised field experience is included. Prerequisite: Ed. 261.

265. IMPROVING READING IN THE UPPER GRADES AND HIGH SCHOOL. 4 HOURS. Investigation of comprehension and thinking as taught by artful questioning; the relationship of study skills and reading to the content areas of the school curriculum. Prerequisite: Ed. 261.

270. EDUCATIONAL PRACTICE WITH SEMINAR I. 8 HOURS. Same as Art Design 284, French 270, Geography 270, German 270, Slavic Languages and Literatures 270, Sociology 290, and Speech and Theater 270. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Ed. 250, admission to advanced standing, and recommendation of the department of specialization.

271. EDUCATIONAL PRACTICE WITH SEMINAR II. 8 HOURS. Same as Art Design 285, French 271, Geography 271, German 271, Slavic Languages and Literatures 271, Sociology 291, and Speech and Theater 271. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Ed. 250, credit or concurrent registration in Ed. 270, admission to or continuation of advanced standing, and recommendation of the department of specialization.

272. EDUCATIONAL PRACTICE WITH SEMINAR—URBAN TEACHER EDUCATION I. 5 HOURS. Restricted to students in innovative urban teacher education programs. The first quarter of a three-quarter professional laboratory sequence, including practice teaching with seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Ed. 250, recommendation of the department of specialization, and approval of the personnel committee of the teacher education project involved.

273. EDUCATION PRACTICE WITH SEMINAR—URBAN TEACHER EDUCATION II. 5 HOURS. Restricted to students in innovative urban teacher education programs. The second quarter of a three-quarter professional laboratory sequence, including practice teaching with seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Ed. 272 and approval of the personnel committee of the teacher education project involved.

274. EDUCATIONAL PRACTICE WITH SEMINAR—URBAN TEACHER EDUCATION III. 6 HOURS. Restricted to students in innovative urban teacher education programs. The third quarter of a three-quarter professional laboratory sequence, including practice teaching with seminar, to meet certification requirements for teaching in the elementary or the secondary school. Prerequisites: Ed. 273 and approval of the personnel committee of the teacher education project involved.

280. SURVEY OF CHARACTERISTICS AND EDUCATION OF EXCEPTIONAL CHILDREN. 4 HOURS. Seminar and observations that consider the physical, mental, emotional, and social characteristics of exceptional children (blind, deaf, mentally retarded, learning disabled, speech impaired, orthopedically handicapped, gifted). Prerequisites: Soc. 100, Ed. 210, and consent of the instructor.

281. PSYCHOEDUCATIONAL ASPECTS OF EXCEPTIONAL CHILDREN I. 4 HOURS. Examination of the social and emotional adjustment of teachers and children in the special education classroom. Discussion and observation of personality, feelings of exceptionality, adjustment mechanisms, classroom therapy, and behavior of children and teachers. Laboratory practice is required. Prerequisites: Ed. 280 and consent of the instructor.

282. PSYCHOEDUCATIONAL ASPECTS OF EXCEPTIONAL CHILDREN II. 4 HOURS. Investigation and examination of the personal professional skills necessary for providing special education for exceptional children; emphasis on the skills necessary for working with emotionally disturbed, learning disabled, and mentally retarded children. Laboratory practice is required. Prerequisites: Ed. 281 and consent of the instructor.

286. EDUCATION AND THE CULTURE OF REVOLUTION. 4 HOURS. Historical and social philosophical analysis of the ways schools reflect, support, and perpetuate the values, drives, and organizational imperatives of American society. Emphasis on their contributions (intended and unintended) to the radicalization of youth and minorities. Prerequisite: Sophomore standing.

290. CHARACTERISTICS OF CHILDREN WITH SPECIAL LEARNING DISABILITIES. 5 HOURS. Clinic-workshop investigation of the significant psychological, educational, environmental, and medical correlates of special learning disabilities. Definitions, terminology, prevalence, characteristics, theories, and organizational structures. Prerequisite: Ed. 282.

291. METHODS OF TEACHING CHILDREN WITH SPECIAL LEARNING DISABILITIES. 5 HOURS. Clinic-workshop investigation of diagnostic-remedial methods and their implementation in the special program for learning disabled children. Analysis and synthesis of multidisciplinary research in the development and practice of a scientific pedagogy for special learning disabilities. Prerequisite: Ed. 290.

292. SPECIAL EDUCATION PRACTICUM—LEARNING DISABILITY. 16 HOURS. Full-time practice teaching in a special education program that involves children who have learning disabilities; a weekly seminar focuses on the problems that occur while working with these students. Prerequisite: Ed. 291.

293. SPECIAL EDUCATION PRACTICUM—MENTAL RETARDATION. 16 HOURS. Full-time practice teaching in a special education program that involves children who are mentally retarded; a weekly seminar focuses on the problems that occur while working with these students. Prerequisite: Ed. 295.

294. CHARACTERISTICS OF THE MENTALLY RETARDED CHILD. 5 HOURS. Definitions, characteristics, classifications, etiology and syndromes, diagnosis and theoretical approaches, rehabilitation procedures, and educational implications. Laboratory practice is required. Prerequisites: Ed. 282 and consent of the instructor.

295. METHODS OF TEACHING THE EDUCABLE MENTALLY HANDICAPPED CHILD. 5 HOURS. Curriculum development; diagnostic procedures; educational materials, methods, and techniques. Clinical practice in administering, interpreting, and evaluating diagnostic techniques is required. Prerequisites: Ed. 294 and consent of the instructor.

296. SPECIAL EDUCATION PRACTICUM–EMOTIONALLY DISTURBED CHILD. 16 HOURS. Full-time practice teaching in a special education program that involves children who are emotionally disturbed; a weekly seminar focuses on the problems that occur while working with these students. Prerequisite: Ed. 298.

297. PSYCHOLOGY OF THE MALADJUSTED CHILD. 5 HOURS. A clinical course combining field experiences, seminar activities, and lectures. Aspects of educational and psychological diagnosis of emotionally disturbed children served at the elementary school level; translating diagnostic materials into educational goals. Prerequisite: Ed. 282.

298. CLASSROOM MANAGEMENT AND REMEDIAL INTERVENTIONS. 5 HOURS. A clinical course utilizing field experiences, seminars, and lecture formats. Task and maintenance functions in the classroom, including methods, techniques, and materials to be used in teaching emotionally disturbed children. Individual and group management problems in the classroom. Prerequisite: Ed. 297.

299. INDEPENDENT STUDY PROGRAM. 1 TO 4 HOURS. For undergraduate students who wish to do independent study on specific educational processes or to do independent study on projects related to education or to carry on extensive reading assignments. Prerequisite: A written proposal for faculty approval.

301. EDUCATIONAL POLICY IN URBAN AMERICA. 4 HOURS. Same as Political Science 301. Examination of selected urban phenomena in relation to educational bureaucracies and school socialization processes. Emphasis on: historical investigation of strategies for protest and change employed by ghetto populations; conditions which fostered these strategies; responses of schools and other target institutions; social philosophical analysis of ideologies supporting both protest and response. Prerequisites: One course in the social foundations of education or the equivalent, and consent of the instructor.

302. PHILOSOPHY OF EDUCATION AND URBAN SCHOOL POLICY. 4 HOURS. Systematic exploration of selected educational theories and philosophies; particular emphasis on their impact on the problems of formulating urban educational policy. Areas of special concern: serving pluralistic interests, curriculum design, school organization, and school control. Prerequisite: One course in the foundations of education or the equivalent.

303. POLICY ISSUES IN THE HISTORY OF AMERICAN EDUCATION. 4 HOURS. A topical analysis of political, economic, and cultural influences shaping the development of American education policy; primary attention to issues of education theory and practice in their historical settings. Prerequisite: Ed. 170 or the equivalent.

304. PRACTICUM IN EARLY CHILDHOOD EDUCATION. 4 HOURS. Field placement in a child development center under the supervision of an approved qualified teacher. Experience in planning activities, evaluating the developmental progress of the children, and methods of child management. Weekly seminars to discuss the work. Prerequisite: Ed. 210 or 250 or Psch. 220.

305. EDUCATION POLICY FOR CITIZENS. 4 HOURS. Same as Social Work 305. The concepts and information that all citizens need to participate effectively as education consumers and policy affectors. History, economics, basic statistics, sociology, research, and current and future trends affecting American education at all levels. Prerequisite: Consent of the instructor.

320. SOCIAL DEVELOPMENT OF URBAN the elementary or the secondary school. Prerequisites: Ed. 273 and approval of the personnel committee socialization during childhood, and the factors common to urban children that illustrate and modify these principles. Classroom observation of children and interviewing is required. Prerequisite: Psch. 220 or the equivalent by consent of the instructor.

321. ADVANCED EDUCATIONAL PSYCHOLOGY. 4 HOURS. Examination of psychological theories and principles of learning as they apply to the teaching-learning process; particular attention to the investigation of central concepts of the psychology of learning in the urban classroom. Prerequisites: Ed. 210 and 250 or the equivalents and consent of the instructor.

322. ADVANCED DEVELOPMENTAL PSYCHOLOGY AND EDUCATIONAL PROCESSES. 4 HOURS. Normal growth stages in language, physical growth, cognitive development, and social behavior from birth through adolescence; their relationship to major theories and to educational planning and practice. Prerequisite: Ed. 321.

323. INTRODUCTION TO EARLY CHILDHOOD EDUCATION. 6 HOURS. 4 hours class time; 6 hours per week in schools. Educational implications of major schools of thought concerning the nature and course of child development and learning; differential effectiveness of programs oriented to various theories; special emphasis on intervention programs designed for impoverished populations, including Head Start. Prerequisites: Psch. 101 and 220 or the equivalents and consent of the instructor.

324. DIFFERENTIAL DIAGNOSIS OF LEARNING AND BEHAVIOR PROBLEMS. 4 HOURS. Characteristics of children with learning and behavioral problems. Theoretical basis for diagnosis and remediation of learning and behavior disorders. Prerequisite: Ed. 325.

325. LEARNING BEHAVIOR PROBLEMS IN SCHOOL: DETECTION AND PROGRAM PLANNING. 4 HOURS. Development and organization of special education programs for children who have learning disabilities, emotional and behavior disorders, are educationally mentally retarded, or have impaired hearing. Screening techniques, referral processes, educational objectives, and program structure are considered. Prerequisite: Ed. 321.

326. PRESCRIPTIVE AND REMEDIAL TEACHING IN SPECIAL EDUCATION. 4 HOURS. Various techniques for the remediation of learning and behavioral problems; application of these methods to a wide variety of school learning and behavior problems. Demonstration by students of ability to assess and plan successful remedial programs for individual children. Prerequisite: Permission to take graduate-level courses in special education.

329. INTRODUCTION TO THE THEORY OF JEAN PIAGET. 4 HOURS. Jean Piaget's genetic theory of the development of knowledge. Emphasis on his studies of cognitive development in children, especially his views on memory, learning, and intelligence. Consideration of educational implications. Prerequisites: Psch. 101, 220.

330. CURRICULUM, INSTRUCTION, AND EVALUATION IN URBAN EDUCATION I. 4 HOURS. A laboratory-discussion course; emphasizes the changing role of education in urban society and the implications of changes on curriculum decision making, design, instruction, and evaluation. Prerequisites: Ed. 250 or graduate standing and consent of the instructor.

331. IMPROVING LEARNING ENVIRONMENTS. 4 HOURS. Development of the basic skills and the understanding necessary to bring about productive changes in a school system; the skills are developed in conjunction with that of a plan for improving a specific learning environment. The consequences of change in the school as a social system. Prerequisites: One methods course or graduate standing and consent of the instructor.

332. ISSUES IN SECONDARY CURRICULUM. 4 HOURS. Analysis of selected issues; investigation of viewpoints in related literature; field investigations when pertinent. Specialists are invited. Prerequisite: Ed. 230 or a methods course offered in the student's major department or graduate standing.

360. DIFFERENTIATED READING INSTRUCTION. 4 HOURS. Students acquire competency in the teaching of individualized reading, remedial reading, and reading advancement programs through supervised field experience and seminar discussions. Prerequisites: Ed. 262 or 265 and consent of the instructor.

370. FIELD WORK FOR URBAN EDUCATION. 8 HOURS. Time is shared between field work and the classroom to enable students to become intimately aware of some aspects of city life as it affects children and education. The different work sections are: (1) workers in a black community; (2) workers in a Latin or Indian community; (3) workers in a selected white ethnic community; (4) school administrators and counselors; (5) workers in human relations arenas. Prerequisites: Ed. 250 or graduate standing and consent of the instructor.

371. COMMUNITY EDUCATION LABORATORIES. 5 HOURS. 3 hours class time; 10 to 14 hours per week in directed field work. Analysis of the colonialist nature of the educational enterprise and of the relationships among the educational controllers, the teacher, and the community, through reading, lecture, discussion, and field work. Consideration of techniques for altering professional accountability of teachers from the employing community to those people the teacher purports to help: student and community. Prerequisite: Consent of the instructor.

383. TEACHING ENGLISH AS A SECOND LANGUAGE. 4 HOURS. Same as English 383. The methodology of teaching English to residents of the United States who do not speak the language, especially Spanish-Americans. Prerequisite: Engl. 300 or 205 or Ling. 305.

390. CRITIQUE OF EDUCATIONAL LITERATURE, RESEARCH DESIGN, AND METHODOLOGY. 4 HOURS. Introduction to educational research literature; analysis of research findings in urban education; research methods and design in education; current issues in research methodology. Each student formulates a researchable problem and designs a systematic study in his area of concentration. Prerequisites: Ed. 250 or graduate standing and consent of the instructor.

ENERGY ENGINEERING (EnrE)

201. THERMODYNAMICS. 5 HOURS. Work and energy. Simple kinetic theory. Temperature. First law of thermodynamics and applications. Properties and state. Equations of state and phases of matter. Second law of thermodynamics. Equilibrium. Gibbs' equations. Entropy. Maxwell relations. Clapeyron equation. Applications. Discussion and laboratory. Prerequisites: Math. 133 and Phys. 131.

202. INTERMEDIATE THERMODYNAMICS. 4 HOURS. Thermodynamics of state. Vapor and gas power cycles; refrigeration cycles. Prerequisite: EnrE. 201.

203. THERMODYNAMICS OF POWER SYSTEMS. 4 HOURS. In-depth analysis of thermodynamics as applied to power systems. Irreversibility and availability, Brayton and Rankine cycles, advanced power systems, environment problems associated with power systems. Prerequisite: EnrE. 202.

211. FLUID MECHANICS. 4 HOURS. Fluid properties. Dimensional analysis. Statics and kinematics. Conservation equations. Inviscid, incompressible flow; Bernoulli's equation. Integral momentum theorem. Viscous flow. Qualitative discussion of turbulent flow and the boundary layer concept. Applications to internal and external flows. Moody's diagram. Discussion and laboratory. Prerequisites: MatE. 200 and Math. 133.

212. POTENTIAL FLOW. 4 HOURS. Basic irrotational flows, their combination and transformation used in modeling flows with solid surfaces. Elementary, two-dimensional airfoil theory. Prerequisite: EnrE. 211.

213. COMPRESSIBLE FLOW. 4 HOURS. Compressible, isentropic, one-dimensional flow. Waves and characteristics in supersonic flows. Prerequisite: EnrE. 211.

214. VISCOUS FLUID MECHANICS. 4 HOURS. Governing equations, energy dissipation, exact and approximate solutions, boundary layer theory, turbulent flows. Prerequisite: EnrE. 211.

215. ENGINEERING HYDROLOGY. 4 HOURS. Basic principles, methods of analysis, and applications for engineering planning and design. Major topics include the various phases of the hydrologic cycle, data collection and interpretation, water resources systems, determination of flow capacity for hydraulic structures. Statistical analysis. Prerequisite: EnrE. 211.

216. OCEANOGRAPHY. 4 HOURS. A study of the marine environment, both chemical and physical. Waves, currents, and mixing processes. Marine organisms. Prerequisite: EnrE. 214.

217. INTRODUCTION TO METEOROLOGY. 4 HOURS. The structure and thermodynamics of the atmosphere. Aspects of cloud formation, precipitation mechanisms, and heat transfer as related to meteorological phenomena. Wind structure and turbulence in the lower atmosphere. Study of the overall system. Prerequisites: EnrE. 211 and Math. 220.

221. HEAT TRANSFER. 4 HOURS. Modes of heat transfer, material properties. One- and two-dimensional conduction. Extended surfaces. Analogue, graphical, and numerical techniques. Forced and free convection. Heat exchangers. Radiation. Shape factors. Ideal and real surfaces. Laboratories in conduction, convection, and radiation. Prerequisites: EnrE. 201 and 211.

232. MATERIAL AND ENERGY BALANCES. 3 HOURS. Material and energy balances applied to chemical systems. Thermochemical calculations of heats of reaction and combustion. Vapor pressure, solubility, and partial pressure. Calculations of chemical and metallurgical process systems. Prerequisites: EnrE. 201, Chem. 221 or consent of the instructor.

234. HEAT AND MOMENTUM OPERATIONS. 4 HOURS. Transport processes of chemical engineering. Fluid systems, non-Newtonian fluids. Flow through porous

media. Filtration. Centrifuging. Heat transfer with and without change of phase. Evaporation. Prerequisites: EnrE. 211 and 232.

235. CHEMICAL ENGINEERING LABORATORY I. 2 HOURS. A 3-hour laboratory devoted to the study of mass, heat, and momentum transfer operations associated with chemical process equipment. Supplements Energy Engineering 234. Prerequisites: EnrE. 232, credit or registration in EnrE. 234.

237. CHEMICAL DIFFUSIONAL OPERATIONS LABORATORY. 2 HOURS. Experimental study of mass, momentum, and heat transfer processes. Experiments are conducted on distillation, absorption, extraction, humidification, and drying equipment with a view toward understanding fundamental transport phenomena. Prerequisite: EnrE. 285.

241. EXPERIMENTAL METHODS IN SOLID AND FLUID MECHANICS. 4 HOURS. Same as Materials Engineering 241. Introduction to the theory and practice of experimental methods, measurement techniques in solids and fluids, analysis of errors. Concurrent laboratory experiments and reports. Prerequisites: EnrE. 211, MatE. 102 and 103.

251. INTRODUCTION TO ELECTROMECHANICAL DEVICES. 4 HOURS. Credit is not given for both Energy Engineering 251 and 351. Mechanical forces from electromagnetic fields and from conservation of energy. Practical introduction to operation and control of commutator, synchronous, and induction machines; transformers. New devices—magnetohydrodynamics. Laboratories. Prerequisites: Phys. 231, EnrE. 211, InfE. 210 or consent of the instructor.

261. INTRODUCTION TO ENVIRONMENTAL POLLUTION CONTROL. 4 HOURS. An introductory course. Scientific and technical problems of environmental pollution control. Air pollution; water pollution; thermal pollution; noise pollution; solid waste disposal; pollution by pesticides. Prerequisite: Sophomore standing or consent of the instructor.

281. DESIGN. 4 HOURS. Independent study course. The design approach involving modeling, analysis, and synthesis of basic fundamentals in engineering problems. Prerequisite: Senior standing.

282. DESIGN. 4 HOURS. Independent study course. The design approach to engineering projects requiring teamwork. Prerequisite EnrE. 281.

285. EQUILIBRIUM STAGE SEPARATIONS. 3 HOURS. Theory and applications of equilibrium concepts to binary vapor-liquid distillation, liquid extraction, solid-gas absorption and solid-liquid leaching, phase diagrams, modern computational methods. Prerequisite: EnrE. 201.

286. CHEMICAL REACTION ENGINEERING. 4 HOURS. Principles of rate processes; application to chemical systems. Development of reactor unit concept. Interpretation of reactor data. Product distribution in multiple reactions; selection of rate controlling step. Application to design. Chemical engineering laboratory experience. Prerequisite: Chem. 342 or the equivalent.

287. MASS TRANSFER OPERATIONS. 3 HOURS. Completes the study of transfer operations as they relate to diffusional processes and simultaneous rate processes. Transport properties for gases and liquids; governing equations under a variety of flow constraints such as drying, humidification, and absorption. Prerequisite: EnrE. 285.

289. COOPERATIVE ENGINEERING PRACTICE. 0 HOURS. Same as Information Engineering 289, Materials Engineering 289, and Systems Engineering 289. Off-campus participation in a government or industrial training program. Prerequisite: Enrollment in the cooperative engineering program.

290. COOPERATIVE ENGINEERING SEMINAR. 1 HOUR. Same as Information Engineering 290, Materials Engineering 290, and Systems Engineering 290. Lectures and seminar for students in the cooperative engineering program. Prerequisite: EnrE. 289, taken during the previous quarter.

292. UNDERGRADUATE RESEARCH. 2 TO 4 HOURS. Research under close supervision of a faculty member. Prerequisites: Senior standing and consent of the instructor.

293. SPECIAL PROBLEMS. 2 TO 4 HOURS. Special problems or reading by special arrangement with the faculty. Prerequisites: Senior standing and consent of the instructor.

304. TRANSPORT PHENOMENA. 4 HOURS. Introduction to continuum theory of momentum, energy, and mass transfer. Transport of scalar and vector quantities. Reynolds' transport theorem. General differential equations of transport phenomena. Momentum shell balances. Energy transport. Diffusion. Coupled operations, free convection, simultaneous heat and mass transfer, and like processes. Prerequisites: EnrE. 201 and 211 or consent of the instructor.

305. STATISTICAL THERMODYNAMICS. 4 HOURS. Microscopic statistical approach to thermodynamic systems. Calculation of partition function and thermodynamic properties. Polyatomic systems; chemical equilibrium; other engineering applications. Prerequisites: EnrE. 201, Math. 220 or the equivalent.

307. KINETIC THEORY OF GASES AND TRANSPORT PHENOMENA. 4 HOURS. Basic concepts of kinetic theory of gases. Equations of state and their molecular interpretation. Elementary classical statistics, molecular collisions. Application of the kinetic theory to viscosity, heat conduction, and diffusion. Prerequisite: Completion of the core program.

311. OCEAN AND ESTUARY HYDRODYNAMICS. 4 HOURS. Fluid mechanics of oceans, estuaries, coastlines, and lakes. Tidal, current, and wave phenomena of large, free-surface bodies of water in rotating coordinates. Laboratory work with rotating water table and wave generation and measurements. Prerequisite: EnrE. 214 or consent of the instructor.

312. POROUS MEDIA. 4 HOURS. Mechanics of fluid flow in porous media. Steady and unsteady laminar flow in isotropic and anisotropic media. Multiphase and multilayered systems. Prerequisites: EnrE. 212 and 215 or consent of the instructor.

313. FLIGHT DYNAMICS: STABILITY AND CONTROL. 4 HOURS. Static and dynamic stability and control of six-degree-of-freedom machines with aerodynamic and propulsive loading. Development of the complete force, moment, orientation, and control equations. Laboratory in aerodynamic force measurements and analog simulation of stability and control. Prerequisite: EnrE. 212 or consent of the instructor.

314. PROPULSION. 4 HOURS. Thermodynamics and fluid mechanics of air-breathing engines. Performance of rockets: chemical, nuclear, and electrical. Prerequisite: EnrE. 213.

316. INTRODUCTION TO CONTINUUM MECHANICS. 4 HOURS. Same as Materials Engineering 316. Cartesian tensors, kinematics of fluids and solids, conservative equations, constitutive equations for simple materials. Examples. Prerequisites: EnrE. 211 or MatE. 204 and Math. 220.

317. INTERMEDIATE FLUID MECHANICS. 4 HOURS. Development of the conservation equations for a Newtonian fluid: continuity, Navier-Stokes, and energy equations. Some exact and approximate solutions of highly viscous, viscous, and inviscid flow problems. Prerequisite: Math. 220 or the equivalent.

321. INTERMEDIATE HEAT TRANSFER. 4 HOURS. Topics in conduction, convection, and radiation with emphasis on exact solutions; extended surfaces, two-phase flow, entrance length problems, real surface and gaseous radiation problems, and combined modes of heat transfer. Laboratory to complement the lectures. Prerequisite: EnrE. 221 or consent of the instructor.

325. COMBUSTION ENGINEERING. 4 HOURS. Topics in combustion, providing both a theoretical and applied understanding of flame processes as they relate to furnace design, air pollution, and propulsion. Heat and mass transfer by various modes, chemistry and dynamics of combustion phenomena. The course will relate to material found in current literature. Prerequisites: EnrE. 201 and either 214 or 234.

331. CHEMICAL ENGINEERING THERMODYNAMICS. 4 HOURS. Review of first and second laws with subsequent applications to chemical systems. Free energy, availability, equilibrium conditions, and applications to chemical processes. Equilibrium constant, chemical potential for gas reactions, heterogeneous systems, and phase change. Prerequisite EnrE. 201 or the equivalent.

335. PHYSICAL PROPERTIES OF FLUIDS. 4 HOURS. Prediction and correlation of the various equilibrium and nonequilibrium properties of pure fluids and their mixtures, such as critical constants, vapor pressure, latent heat of vaporization, heat capacity, heat formation, surface tension, virial coefficients, viscosity, thermal conductivity, and diffusion coefficients. Prerequisites: EnrE. 201 and 211 or consent of the instructor.

341. EXPERIMENTAL METHODS AND TECHNIQUES. 4 HOURS. Purpose and design of experiments; statistical analysis of errors; wind tunnel, shock tube, high vacuum and chemical reactor techniques; theory of mechanical, thermal, optical, and chemical measurements. Prerequisite: Consent of the instructor.

351. ELECTROMECHANICAL ENERGY CONVERSION I. 4 HOURS. Conservation of energy and electromagnetic forces. Principles of rotating machines and equations of motion. Applications to synchronous, induction, d-c, and novel machines. Linear and nonlinear lumped-parameter systems, stability. Laboratories. Prerequisites: InfE. 212 and 219 or consent of the instructor.

352. ELECTROMECHANICAL ENERGY CONVERSION II. 4 HOURS. Continues Energy Engineering 351. Completion of rotating machines and lumped-parameter systems. Interaction of electromagnetic fields with stationary and moving continuous media, Maxwell stress tensor, waves and instabilities. Applications to

energy conversion with emphasis on fluids (magnetohydrodynamics). Laboratories. Prerequisites: EnrE. 211, 351, and InfE. 221.

353. DIRECT ENERGY CONVERSION. 4 HOURS. Novel methods of converting heat directly to electrical energy. Topics are chosen from among, but not limited to, magnetohydrodynamics, thermoelectrics, thermionics, and fuel cells. Prerequisites: EnrE. 211 and 351 or consent of the instructor.

361. ATMOSPHERIC MOTIONS. 4 HOURS. The equations of motion on a rotating earth and their application to meteorology. Various aspects of inertial, geostrophic, and gradient winds. Atmospheric turbulence and flow in the earth's boundary layer. Laboratory modeling criteria and dynamic similitude. Diffusion of heat, water vapor, and atmospheric pollutants. Prerequisite: EnrE. 214 or consent of the instructor.

372. WATER RESOURCES AND POLLUTION CONTROL. 4 HOURS. Hydraulics of water supply and distribution systems. Water quality tests for biological and chemical pollutants. Basic principles and theory of water purification and sanitary engineering, including physical, chemical, and biological treatment processes. Advanced water reclamation techniques. Prerequisites: Chem. 121, EnrE. 261.

391. SEMINAR. 1 TO 4 HOURS. May be repeated for credit. Topics to be arranged. Prerequisite: Consent of the instructor.

396. SENIOR DESIGN I. 4 HOURS. Same as Information Engineering 396, Materials Engineering 396, and Systems Engineering 396. Introduction to engineering economics, legal and social constraints on design, safety and reliability theory, and the use of simulation and optimization techniques in the engineering design process. Prerequisite: Senior standing in the College of Engineering.

397. SENIOR DESIGN II. 4 HOURS. Same as Information Engineering 397, Materials Engineering 397, and Systems Engineering 397. Application of principles of engineering and engineering design methodology to the solution of a large-scale design problem. May be taken in any department, regardless of area of concentration. Prerequisite: EnrE. 396.

ENGLISH (Engl)

101. INTRODUCTION TO POETRY. 4 HOURS. Same as Humanities 101. Reading and discussion of representative poems from the ancient world to the present.

102. INTRODUCTION TO DRAMA. 4 HOURS. Same as Humanities 102. Reading and discussion of representative plays from the ancient world to the present.

103. INTRODUCTION TO FICTION. 4 HOURS. Same as Humanities 103. Reading and discussion of representative fiction from the beginnings to the present.

150. A SURVEY OF ENGLISH LITERATURE I: FROM THE BEGINNINGS THROUGH MILTON. 4 HOURS. Note: English 150, 151, and 152 are required for English majors. A chronological survey of the major works of English literature from about 760 to 1660. Prerequisite: Sophomore standing or exemption from Comp. 102 or James Scholar status.

151. A SURVEY OF ENGLISH LITERATURE II: FROM DRYDEN THROUGH KEATS. 4 HOURS. A chronological survey of the major works of English literature from 1660 to 1832. Prerequisite: Engl. 150.

152. A SURVEY OF ENGLISH LITERATURE III: FROM TENNYSON TO THE PRESENT. 4 HOURS. A chronological survey of the major works of English literature from 1832 to the present. Prerequisite: Engl. 151.

170. INTRODUCTION TO BLACK LITERATURE. 4 HOURS. Same as Black Studies 170. Broad study of the historical trends and influences on black literature from 1900 to the current development of a "black aesthetic"; emphasis on American literature.

195. TOPICS IN ENGLISH AND AMERICAN LITERATURE. 4 HOURS. May be repeated for a maximum of 12 hours. Study of a topic, genre, or movement.

198. FRESHMAN HONORS SEMINAR. 4 HOURS. May be repeated for a maximum of 12 hours. Admission is by invitation after screening by University Honors Office, followed by further testing by the Department. Introduction to literature for selected freshman. The subject of the seminar is changed every quarter. Students who complete three English 198 seminars may earn exemption from English Composition 102. Prerequisites: Freshman standing and admission to the honors program in English.

Note: 200-level and 300-level courses are restricted to juniors, seniors, and to those lower-division students who have the consent of the instructor.

205. MODERN ENGLISH GRAMMARS. 4 HOURS. Introduction to the newer grammars of English, including the structural and transformational; some attention to their applications in the teaching of English. Prerequisite: Junior standing or consent of the instructor.

210. INTRODUCTION TO THE WRITING OF POETRY. 4 HOURS. Practice in writing poetry; emphasis on analysis of student work and published examples. Prerequisite: Satisfactory completion of Comp. 102 or the equivalent.

211. INTRODUCTION TO THE WRITING OF FICTION. 4 HOURS. Practice in writing fiction; emphasis on analysis of student work and published examples. Prerequisite: Satisfactory completion of Comp. 102 or the equivalent.

212. TOPICS IN WRITING. 4 HOURS. Practice in creative writing; emphasis on genres other than poetry and fiction. Content varies. Prerequisite: Satisfactory completion of Comp. 102 or the equivalent.

240. INTRODUCTION TO TECHNIQUES OF LITERARY CRITICISM AND SCHOLARSHIP. 4 HOURS. Methods and approaches to the analysis and criticism of literary texts and techniques of scholarship. Prerequisites: Junior standing, English major, and Engl. 152.

260. SURVEY OF AMERICAN LITERATURE I: FROM THE BEGINNINGS THROUGH HAWTHORNE. 4 HOURS. Representative selections; emphasis on Franklin, Poe, Emerson, Thoreau, and Hawthorne. Prerequisite: Junior standing or consent of the instructor. English 150, 151, and 152 are recommended.

261. SURVEY OF AMERICAN LITERATURE II: FROM MELVILLE THROUGH THE LATE NINETEENTH CENTURY. 4 HOURS. Representative selections;

emphasis on Melville, Whitman, Dickinson, Twain, James, and the Naturalists. Prerequisite: Junior standing or consent of the instructor. English 150, 151 and 152 are recommended.

262. SURVEY OF AMERICAN LITERATURE III: FROM THE EARLY TWENTIETH CENTURY TO THE PRESENT. 4 HOURS. Representative selections; emphasis on Frost, Eliot, Hemingway, Faulkner, and others. Prerequisite: Junior standing or consent of the instructor. English 150, 151 and 152 are recommended.

278. MODERN DRAMA I: FROM 1870 TO 1920. 4 HOURS. Representative selections; emphasis on Ibsen, Strindberg, Shaw, and Chekhov. Prerequisite: Junior standing or consent of the instructor.

279. MODERN DRAMA II: FROM 1920 TO THE PRESENT. 4 HOURS. Representative selections; emphasis on Pirandello, Brecht, O'Neil, Lorca, O'Casey, Giraudoux, Beckett, and others. Prerequisite: Junior standing or consent of the instructor.

280. INTRODUCTION TO LIBRARY SCIENCE AND BIBLIOGRAPHY FOR TEACHERS OF HIGH SCHOOL ENGLISH. 4 HOURS. Examination of the principles of library organization, bibliography, research, and book selection for grades seven through twelve. Prerequisites: Junior standing and Engl. 150, 151, and 152 or consent of the instructor.

281. TEACHING OF ENGLISH. 4 HOURS. For prospective teachers of English in secondary schools. Emphasis on theory and practice. Required to be taken the quarter before student teaching. Prerequisite: Senior standing or consent of the instructor.

295. TOPICS IN ENGLISH AND AMERICAN LITERATURE. 4 HOURS. May be repeated for a maximum of 12 hours. Study of a topic, genre, or movement. Content varies. Prerequisite: Junior standing or consent of the instructor.

296. STUDENT-INITIATED COURSE. 4 HOURS. Study of an author, topic, movement, or genre; emphasis on English and American literature. All course proposals must be approved by the English Department before the course can be offered. Instructions for the submission of course proposals may be obtained from the department. Prerequisite: Junior standing or consent of the instructor.

297. SENIOR SEMINAR. 4 HOURS. May be repeated for a maximum of 12 hours. Study of an author, topic, genre, or movement. Content varies. Prerequisites: Senior standing and 12 hours of English. Engl. 150, 151, and 152 are recommended.

298. SENIOR HONORS SEMINAR. 4 HOURS. May be repeated for a maximum of 12 hours. Study of an author, topic, movement, or genre. Content varies. Prerequisites: Senior standing and admission to the honors program in English.

299. INDEPENDENT STUDY IN ENGLISH AND AMERICAN LITERATURE. 2 TO 4 HOURS. May be repeated for a maximum of 4 hours. Students must consult with the course coordinator about admission and course requirements. Topics must be approved by the departmental course coordinator, must not duplicate material covered in any currently listed course in the English or humanities curricula. For minimum of 2 hours of credit, the student must write a paper of

substance, a copy of which must be filed with the course coordinator at the end of the quarter in which the course is taken. Registration for 299 is closed after the tenth day of instruction in any quarter. Prerequisites: Senior standing; for English majors, a grade-point average of 4.000 in all English courses above the 100 level; for nonmajors, a grade-point average of 4.200 in all English courses at the 100 level or above.

300. HISTORY OF THE ENGLISH LANGUAGE. 4 HOURS. English in its relationship to other languages; historical account of its development. Prerequisite: Senior standing or 12 hours of English or consent of the instructor.

301. THE STRUCTURE OF MODERN ENGLISH. 4 HOURS. Critical evaluation of traditional, structural, and transformational grammatical descriptions; detailed survey of a transformational syntax of English. Prerequisite: Engl. 300 or Ling. 305.

302. INTRODUCTION TO OLD ENGLISH. 4 HOURS. The elements of Old English grammar and the reading of graded prose selections. Prerequisite: Senior standing or 12 hours of English or consent of the instructor.

303. OLD ENGLISH POETRY AND PROSE. 4 HOURS. Representative selections of prose and poetry of England to 1200, exclusive of *Beowulf*. Prerequisite: Engl. 302 or the equivalent.

304. *BEOWULF*. 4 HOURS. A detailed explication of the poem. Prerequisite: Engl. 303 or the equivalent.

305. INTRODUCTION TO MIDDLE ENGLISH. 4 HOURS. A linguistic examination of Middle English and its dialects. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

306. ENGLISH LITERATURE OF THE MIDDLE AGES I. 4 HOURS. Representative selections; emphasis on the courtly and popular secular literature. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

307. ENGLISH LITERATURE OF THE MIDDLE AGES II. 4 HOURS. Representative selections; emphasis on the religious and moral literature. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

308. CHAUCER. 4 HOURS. A survey of Chaucer's major works. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

310. ENGLISH LITERATURE OF THE RENAISSANCE I. 4 HOURS. Representative selections; emphasis on Skelton, More, Elyot, Wyatt, Surrey, Lyly, Sidney, Spenser, and Marlowe. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

311. ENGLISH LITERATURE OF THE RENAISSANCE II. 4 HOURS. Representative selections; emphasis on Ralegh, Bacon, Donne, Jonson, Hobbes, Herbert, Browne, and Milton. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

312. RENAISSANCE DRAMA, EXCLUSIVE OF SHAKESPEARE. 4 HOURS. May be repeated for a maximum of 8 hours of credit. Content varies between Tudor drama (Udall, Norton, Sackville, Lyly, Kyd, Marlowe, Dekker, and others) and Stuart drama (Chapman, Marston, Jonson, Beaumont, Fletcher, Webster,

313. SHAKESPEARE I. 4 HOURS. The poems and early plays. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

314. SHAKESPEARE II. 4 HOURS. The later plays. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

315. MILTON. 4 HOURS. A survey of Milton's poetry and prose, with emphasis on his major works. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

316. MAJOR AUTHORS IN RENAISSANCE LITERATURE. 4 HOURS. May be repeated for a maximum of 12 hours of credit. Study of a single figure, such as Spenser, Donne, Jonson. Content varies. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

317. STUDIES IN RENAISSANCE LITERATURE. 4 HOURS. May be repeated for a maximum of 12 hours of credit. Study of a topic, movement, or genre. Content varies. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

320. ENGLISH LITERATURE OF THE RESTORATION AND EIGHTEENTH CENTURY I, 1660 to 1714. 4 HOURS. Representative selections; emphasis on Dryden, Restoration drama, and the early works of Swift and Pope. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

321. ENGLISH LITERATURE OF THE RESTORATION AND EIGHTEENTH CENTURY II, 1715 TO 1744. 4 HOURS. Representative selections; emphasis on the early novelists (Defoe, Richardson, and Fielding) and the later works of Swift and Pope. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

322. ENGLISH LITERATURE OF THE RESTORATION AND EIGHTEENTH CENTURY III, 1745 TO 1789. 4 HOURS. Representative selections; emphasis on the Johnson circle and the mid-century novelists (Richardson, Fielding, Sterne, and Smollett). Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

323. RESTORATION AND EIGHTEENTH CENTURY DRAMA. 4 HOURS. May be repeated for a maximum of 8 hours of credit. Restoration drama (principally Dryden, Etherege, Wycherley, Otway, Shadwell, Vanbrugh, Cibber, and Congreve) and eighteenth century drama (Addison, Steele, Gay, Fielding, Farquhar, Cumberland, Sheridan, Goldsmith, and others). Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

324. THE EIGHTEENTH CENTURY NOVEL. 4 HOURS. Representative selections; emphasis on Defoe, Richardson, Fielding, Sterne, Smollett, and some of the minor novelists of the period. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

325. MAJOR AUTHORS OF RESTORATION AND EIGHTEENTH CENTURY LITERATURE. 4 HOURS. May be repeated for a maximum of 12 hours of credit. Study of a single figure, such as Dryden, Swift, Pope, Johnson, Fielding. Content varies. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

326. STUDIES IN RESTORATION AND EIGHTEENTH CENTURY LITERATURE. 4 HOURS. May be repeated for a maximum of 12 hours of credit. Study of a topic, movement, or genre. Content varies. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

330. ENGLISH LITERATURE OF THE ROMANTIC PERIOD I. 4 HOURS. Representative selections; emphasis on Blake, Wordsworth, and Coleridge. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

331. ENGLISH LITERATURE OF THE ROMANTIC PERIOD II. 4 HOURS. Representative selections; emphasis on Byron, Shelley, and Keats. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

332. MAJOR AUTHORS OF THE ROMANTIC PERIOD. 4 HOURS. May be repeated for a maximum of 12 hours of credit. Study of a single figure, such as Blake, Wordsworth, Coleridge, Byron, Shelley, and Keats. Content varies. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

333. STUDIES IN ROMANTIC LITERATURE. 4 HOURS. May be repeated for a maximum of 12 hours of credit. Study of a topic, movement, or genre. Content varies. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

340. ENGLISH LITERATURE OF THE VICTORIAN PERIOD I: POETRY. 4 HOURS. Representative selections; emphasis on Tennyson, Browning, Arnold, Swinburne, Hopkins, Hardy. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

341. ENGLISH LITERATURE OF THE VICTORIAN PERIOD II: NONFICTION PROSE. 4 HOURS. Representative selections; emphasis on Carlyle, Mill, Newman, Arnold, Ruskin, Pater. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

342. ENGLISH LITERATURE OF THE VICTORIAN PERIOD III: THE NOVEL. 4 HOURS. Representative selections; emphasis on Dickens, Thackeray, Trollope, Eliot, Meredith, Butler, Hardy. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

343. MAJOR AUTHORS IN VICTORIAN LITERATURE. 4 HOURS. May be repeated for a maximum of 12 hours of credit. Study of a single figure, such as Arnold, Browning, Carlyle, Dickens, Eliot, Mill, Newman, Tennyson, Thackeray, Trollope. Content varies. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

344. STUDIES IN VICTORIAN LITERATURE. 4 HOURS. May be repeated for a maximum of 12 hours of credit. Study of a topic, movement, or genre. Content varies. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

350. MODERN BRITISH LITERATURE I: 1890 TO 1930. 4 HOURS. Representative selections; emphasis on Yeats, Shaw, de la Mare, Conrad, Joyce, Woolf, Lawrence, and others. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

351. MODERN BRITISH LITERATURE II: 1930 TO THE PRESENT. 4 HOURS. Representative selections; emphasis on Yeats, Auden, Thomas, Spender, Greene, Huxley, Pinter, and others. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

352. MODERN BRITISH FICTION I: 1890 TO 1930. 4 HOURS. Conrad, Forster, Joyce, Lawrence, Woolf, and others. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

353. MODERN BRITISH FICTION II: 1930 TO THE PRESENT. 4 HOURS. Survey: representative selections, with emphasis on Waugh, Orwell, Williams, Wilson, Murdoch, Powell, and others. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

354. MODERN IRISH LITERATURE: 1880 TO THE PRESENT. 4 HOURS. May be repeated for a maximum of 8 hours of credit. Representative selections; emphasis on George Moore, Wilde, Yeats, Gregory, Synge, Stephens, Joyce, O'Faolain, O'Connor. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

355. MAJOR AUTHORS OF MODERN BRITISH LITERATURE. 4 HOURS. May be repeated for a maximum of 12 hours of credit. Study of a single figure, such as Auden, Beckett, Conrad, Joyce, Lawrence, Woolf, Yeats, and Shaw. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

356. STUDIES IN MODERN BRITISH LITERATURE. 4 HOURS. May be repeated for a maximum of 12 hours of credit. Study of a topic, movement, or genre. Content varies. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

360. AMERICAN POETRY I: BEGINNINGS TO 1900. 4 HOURS. Representative selections; emphasis on Taylor, Emerson, Poe, Whitman, Dickinson, and others. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

361. AMERICAN POETRY II: 1900 TO THE PRESENT. 4 HOURS. Representative selections; emphasis on Frost, Pound, Eliot, Cummings, Stevens, Williams, Lowell. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

362. THE AMERICAN NOVEL I: 1800 TO 1860. 4 HOURS. Representative selections; emphasis on Brown, Cooper, Hawthorne, Melville, and others. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

363. THE AMERICAN NOVEL II: 1860 TO 1900. 4 HOURS. Representative selections; emphasis on Twain, James, Howells, Adams, Jewett, Frederic, and Norris. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

364. THE AMERICAN NOVEL III: 1900 TO 1945. 4 HOURS. Representative selections; emphasis on Dreiser, Lewis, Fitzgerald, Hemingway, Faulkner, Wolfe. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

365. THE AMERICAN NOVEL SINCE WORLD WAR II. 4 HOURS. Representative selections; emphasis on Warren, Mailer, Ellison, Nabokov, Malamud, Bellow, and others. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

366. MAJOR AUTHORS IN AMERICAN LITERATURE. 4 HOURS. May be repeated for a maximum of 12 hours of credit. Study of a single figure, such as Hawthorne, Melville, Whitman, Dickinson, Howells, James, Twain, Hemingway, Faulkner, and others. Content varies. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

367. PERIODS AND MOVEMENTS IN AMERICAN LITERATURE. 4 HOURS. May be repeated for a maximum of 12 hours of credit. Study of a single topic, such as the American Renaissance, Early National Literature, and the Twenties, or of such movements as Puritanism, Transcendentalism, Realism, Naturalism, Imagism, and others. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

368. STUDIES IN AMERICAN LITERATURE. 4 HOURS. May be repeated for a maximum of 12 hours of credit. Study of a topic or genre. Content varies. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

370. STUDIES IN BLACK LITERATURE. 4 HOURS. May be repeated for a maximum of 12 hours. Same as Black Studies 370. Study of a theme, genre, movement, or author in black literature, with emphasis on American literature. Prerequisite: Senior standing or 12 hours of English or consent of the instructor. English 170 is recommended.

375. HISTORY OF LITERARY CRITICISM I. 4 HOURS. A survey, with emphasis on the major critics from Plato to Johnson. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

376. HISTORY OF LITERARY CRITICISM II. 4 HOURS. A survey of nineteenth century and modern literary criticism, with emphasis on the major critics from Wordsworth to the present. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

383. TEACHING ENGLISH AS A SECOND LANGUAGE. 4 HOURS. Same as Education 383. The methodology of teaching English to residents of the United States who do not speak the language, especially Spanish-Americans. Prerequisite: Engl. 300 or 205 or Ling. 305.

385. STUDIES IN TEACHING THE ENGLISH LANGUAGE AND LINGUISTICS. 4 HOURS. May be repeated for a maximum of 12 hours of credit. Study of a topic in teaching linguistics and the English language. Content varies.

386. STUDIES IN TEACHING RHETORIC AND COMPOSITION. 4 HOURS. May be repeated for a maximum of 12 hours of credit. Study of a topic in teaching rhetoric and composition. Content varies.

390. THE WRITING OF POETRY. 4 HOURS. May be repeated for a maximum of 8 hours. Advanced practice in the writing of poetry; emphasis on analysis of student work and on published examples. Prerequisite: Satisfactory completion of Engl. 210 or the equivalent or consent of the instructor.

391. THE WRITING OF FICTION. 4 HOURS. May be repeated for a maximum of 8 hours. Advanced practice in the writing of fiction; emphasis on analysis of student work and on published examples. Prerequisite: Satisfactory completion of Engl. 211 or the equivalent or consent of the instructor.

395. STUDIES IN BRITISH AND AMERICAN DRAMA. 4 HOURS. May be repeated for a maximum of 12 hours of credit. Study of an author, a topic, or a movement. Content varies. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

398. STUDIES IN GENRES, MODES, MULTIMEDIA, INFLUENCES, AND MOVEMENTS. 4 HOURS. May be repeated for a maximum of 12 hours of credit. Study of a particular subject in literature. Content varies. Prerequisite: Senior standing or 12 hours of English (Engl. 150, 151, 152 recommended) or consent of the instructor.

399. INDEPENDENT STUDY. 1 TO 4 HOURS. Open only to English majors and graduate students in English. Admission to this course is only on the advice and initiation of the English Department. Individual studies under the direction of an assigned faculty member. The nature of the work is determined by the tutor on the basis of the student's needs and interests. Prerequisite: Senior standing.

ENGLISH COMPOSITION (Comp)

101. FRESHMAN COMPOSITION I. 4 HOURS. Elementary training and practice in the comprehension and expression of written English.

102. FRESHMAN COMPOSITION II. 4 HOURS. Elementary training and practice in the comprehension and expression of written English. Prerequisite: Completion of Comp. 101 or the equivalent.

103. ENGLISH AS A FOREIGN LANGUAGE I. 4 HOURS. Intensive review of basic English structure for foreign students inadequately prepared for English Composition 101. Prerequisites: Reading knowledge of English, ability to understand instructions, and consent of the instructor.

104. ENGLISH AS A FOREIGN LANGUAGE II. 4 HOURS. Continues English Composition 103. For students who may be inadequately prepared for English Compostion 101. A rapid, intensive review of basic English structure; study of more complicated sentence patterns; practice in oral and written composition. Prerequisite: Comp. 103 or consent of the instructor.

105. ENGLISH AS A FOREIGN LANGUAGE III. 4 HOURS. May be taken concurrently with English Composition 101. Intensive remedial writing for the foreign student in the area of his special difficulties. Prerequisite: Comp. 104 or consent of the instructor.

115. ADVANCED COMPOSITION. 4 HOURS. Practice in exposition; emphasis on organization, paragraphing, and sentence structure. Prerequisite: Grade of A or B in Comp. 102.

180. INTRODUCTION TO COMPOSITION. 4 HOURS. May be repeated for a maximum of 12 hours. For students participating in the Educational Assistance Program. Basic grammar, sentence structure, organization and development of paragraphs and themes.

200. COMPOSITION PRACTICE I. 2 HOURS. Primarily for juniors and seniors; open to graduate students for 0 hours of credit. Improvement of composition skills; emphasis on review of mechanics, sentence structure, organization, and development. Prerequisite: Satisfactory completion of Comp. 102 or the equivalent.

201. COMPOSITION PRACTICE II. 2 HOURS. Improvement of composition skills; emphasis on review of research techniques and practice in writing analytical and investigative papers. Prerequisite: Comp. 102 or 200 or the equivalent.

251. BUSINESS COMMUNICATION. 4 HOURS. Study and practice in written informative and/or persuasive communications in business and industry. Prerequisites: Comp. 101 and 102.

FINANCE (Fin)

340. MONEY AND BANKING. 4 HOURS. Monetary and banking systems. The Federal Reserve System; monetary theory; international monetary relations; monetary policy in the United States. Prerequisite: Econ. 121.

341. BUSINESS FINANCE. 4 HOURS. Nature of business finance and its relation to economics, accounting, and law; legal nature and forms of business enterprise; capital, capitalization, and financial planning; financial analysis and interpretation; initial financing, refinancing, working capital; income administration, including dividend policies; expansion; internal and external financial and economic relationships of the firm. Prerequisites: Actg. 102 and Econ. 120.

342. INVESTMENTS. 4 HOURS. Types and distinguishing features of securities, security markets, analysis of financial statements and principles of valuation, quality differences, selection of securities to meet varying personal and institutional objectives. Prerequisites. Fin. 340 and 341.

343. RISK AND INSURANCE. 4 HOURS. Basic principles; applications in different areas (life and property insurance); management of risks in the firm (insurance versus self-insurance); social and economic significance of insurance in the economy. Prerequisites: Fin. 340 and 341.

344. INVESTMENT POLICY. 4 HOURS. Varying strategies to meet diverse objectives; investments for individuals, business firms, banks, insurance companies, pension and profit-sharing funds; interrelation of investment policies and the economic environment. Prerequisite: Fin. 342.

345. PROBLEMS IN BUSINESS FINANCE. 4 HOURS. Selected areas in advanced corporate finance, including short term asset management; capital budgeting under certainty and uncertainty; capital structure and dividend policy and theory; valuation and risk; the structure of capital asset prices and implications of that structure for financial policy of firms. Prerequisite: Fin. 341.

FRENCH (Fr)

101. ELEMENTARY FRENCH. 4 HOURS. Two additional half hours per week in the language laboratory. For students who have not studied French. Grammar, pronunciation, reading, composition, conversation.

102. ELEMENTARY FRENCH. 4 HOURS. Two additional half hours per week in the language laboratory. Continues French 101. Prerequisite: Fr. 101 or the equivalent.

103. ELEMENTARY FRENCH. 4 HOURS. Two additional half hours per week in the language laboratory. Continues French 102. Prerequisite: Fr. 102 or the equivalent.

104. INTERMEDIATE FRENCH. 4 HOURS. Two additional half hours per week in the language laboratory. Rapid reading of modern authors, syntax and composition, conversational practice. Prerequisite: Fr. 103 or two years of high school French or the equivalent.

105. INTERMEDIATE FRENCH. 4 HOURS. Two additional half hours per week in the language laboratory. Continues French 104. Prerequisite: Fr. 104 or the equivalent.

106. INTERMEDIATE FRENCH. 4 HOURS. Two additional half hours per week in the language laboratory. Continues French 105. Prerequisite: Fr. 105 or the equivalent.

107. READING FRENCH I. 4 HOURS. Primarily for upper division and graduate students in other departments. Does not meet graduation requirements in a foreign language. Basic grammar, vocabulary, and reading practice for beginning students who wish to acquire a rapid reading knowledge of French.

108. READING FRENCH II. 4 HOURS. Grammar, vocabulary; general and special reading and translation. Prerequisite: Fr. 107 or 103 or the equivalent.

109. READING FRENCH III. 4 HOURS. Continues French 108. Prerequisite: Fr. 108 or 105 or the equivalent.

110. INTERMEDIATE FRENCH—READING OPTION I. 4 HOURS. May be substituted for French 104. Satisfies the graduation requirement in the College of Liberal Arts and Sciences if taken with French 111 and 112. Reading in French; emphasis on cultural materials. Class discussion in English. Note: French 110, 111, and 112 do not satisfy the prerequisite requirements for French 201, 202, and 203. Prerequisite: Fr. 103 or two years of high school French or the equivalent.

111. INTERMEDIATE FRENCH—READING OPTION II. 4 HOURS. May be substituted for French 105. Satisfies the graduation requirement in the College of Liberal Arts and Sciences if taken with French 112. Readings in French; emphasis on cultural materials. Class discussion in English. Note: French 110, 111, and 112 do not satisfy the prerequisite requirements for French 201, 202, and 203. Prerequisite: Fr. 110 or the equivalent.

112. INTERMEDIATE FRENCH—READING OPTION III. 4 HOURS. May be substituted for French 106. Satisfies the graduation requirement in the College of

Liberal Arts and Sciences. Readings in French; emphasis on cultural materials. Class discussion in English. Note: French 110, 111, and 112 do not satisfy the prerequisite requirements for French 201, 202, and 203. Prerequisite: Fr. 111 or the equivalent.

113. CONVERSATIONAL PRACTICE. 2 HOURS. Supplements French 104, 105, and 106. Oral practice in the development of elementary conversational skill and the improvement of pronunciation. Prerequisites: Fr. 103 or two years of high school French and concurrent enrollment in Fr. 104, 105, or 106.

114. INTERMEDIATE FRENCH—CONVERSATION OPTION I. 4 HOURS. May be substituted for French 104. Satisfies the graduation requirement in the College of Liberal Arts and Sciences if taken with French 115 and 116. Practice in speaking French. Note:Does not serve as a prerequisite for any 200-level courses in French unless the student passes the French 106 proficiency examination. Prerequisite: Fr. 103 or two years of high school French or the equivalent.

115. INTERMEDIATE FRENCH—CONVERSATION OPTION II. 4 HOURS. May be substituted for French 105. Satisfies the graduation requirement in the College of Liberal Arts and Sciences if taken with French 116. Practice in speaking French. Note: Does not serve as a prerequisite for any 200-level courses in French unless the student passes the French 106 proficiency examination. Prerequisite: Fr. 114 or the equivalent.

116. INTERMEDIATE FRENCH—CONVERSATION OPTION III. 4 HOURS. May be substituted for French 106. Satisfies the graduation requirement in the College of Liberal Arts and Sciences. Practice in speaking French. Note: Does not serve as a prerequisite for any 200-level courses in French unless the student passes the French 106 proficiency examination. Prerequisite: Fr. 115 or the equivalent.

121. ELEMENTARY FRENCH, HONORS COURSE. 5 HOURS. Open only to James Scholars and others with superior linguistic ability. Grammar, pronunciation, reading, composition, and conversation. Completion of French 121, 122, and 123 leads directly to French 105. Practice in the language laboratory is required. Prerequisite: Approval of the department.

122. ELEMENTARY FRENCH, HONORS COURSE. 5 HOURS. Continues French 121. Practice in the language laboratory is required. Prerequisite: Fr. 121.

123. ELEMENTARY FRENCH, HONORS COURSE. 5 HOURS. Continues French 122. Practice in the language laboratory is required. Prerequisite: Fr. 122.

131. ACCELERATED BEGINNING AND INTERMEDIATE FRENCH I. 8 HOURS. Equivalent to French 101 and 102. Open to James Scholars, students with superior linguistic ability, and students interested in completing and fulfilling their basic and intermediate language in three quarters. Grammar, pronunciation, reading, composition, and conversation. Practice in the language laboratory is required. Prerequisite: Approval of the department.

132. ACCELERATED BEGINNING AND INTERMEDIATE FRENCH II. 8 HOURS. Continues French 131. Practice in the language laboratory is required. Prerequisites: Fr. 131 and approval of the department.

133. ACCELERATED BEGINNING AND INTERMEDIATE FRENCH III. 8 HOURS. Continues French 132. Prerequisite: Fr. 132 or Fr. 104 and approval of the department.

161. FRENCH CIVILIZATION I. 4 HOURS. Same as Humanities 161. History of French civilization from the end of the Middle Ages to the end of the Wars of Religion, considered in the light of changes that were typical for all Western Europe. The literature, religious thought, art, and sciences of this period are viewed against the background of political and social change.

162. FRENCH CIVILIZATION II. 4 HOURS. Same as Humanities 162. Social, political, and religious changes in the seventeenth and eighteenth centuries studied through the literature of the classical period and the French Enlightenment.

163. FRENCH CIVILIZATION III. 4 HOURS. Same as Humanities 163. The ideological struggles and social-political changes of the nineteenth and twentieth centuries in France as seen through the novels, memoirs, histories, and social tracts of the period.

184. GREAT FRENCH WRITERS IN TRANSLATION. 4 HOURS. May be repeated for credit. Not open to French majors or minors. Same as Humanities 184. Selections, in English translation, from the maior works of Frances's greatest writers. Authors are announced each quarter.

186. MASTERPIECES OF FRENCH LITERATURE IN ENGLISH TRANSLATION. 4 HOURS. Same as Humanities 186. Not open to French majors or minors. Reading of selected works from the seventeenth century to the present day.

201. INTRODUCTION TO FRENCH LITERATURE. I. 4 HOURS. Selected masterpieces representing the major genres. Prerequisite: Fr. 106 or four years of high school French or the equivalent.

202. INTRODUCTION TO FRENCH LITERATURE II. 4 HOURS. The major currents and movements of the seventeenth century; reading of selected masterpieces. Prerequisite: Fr. 201 or the equivalent.

203. INTRODUCTION TO FRENCH LITERATURE III. 4 HOURS. The major currents and movements of the eighteenth century; reading of selected masterpieces. Prerequisite: Fr. 201 or the equivalent.

204. INTRODUCTION TO FRENCH LITERATURE IV. 4 HOURS. The major currents and movements of the nineteenth century; reading of selected masterpieces. Prerequisite: Fr. 201 or the equivalent.

205. INTRODUCTION TO FRENCH LITERATURE V. 4 HOURS. The major currents and movements of the twentieth century; reading of selected masterpieces. Prerequisite: Fr. 201 or the equivalent.

211. DICTION AND CONVERSATION I. 3 HOURS. Conversational practice to develop oral facility; exercises for the improvement of pronunciation and diction. Practice in the language laboratory is required. Prerequisite: Fr. 106 or four years of high school French.

212. DICTION AND CONVERSATION II. 3 HOURS. Continues French 211. Practice in the language laboratory is required. Prerequisite: Fr. 211 or the equivalent.

213. DICTION AND CONVERSATION III. 3 HOURS. Continues French 212. May be required of a French major on recommendation of his instructor in French 212. Practice in spoken French. Prerequisite: Fr. 212 or the equivalent or consent of the instructor.

221. COMPOSITION I. 3 HOURS. Training in writing French, translation from English, free composition. Prerequisite Fr. 106 or four years of high school French.

222. COMPOSITION II. 3 HOURS. Advanced study of rules of French grammar; special attention to the analysis of sentence structure. Exercises in advanced composition. Prerequisite: Fr. 221 or the equivalent.

223. COMPOSITION III. 3 HOURS. May be required of a French major on recommendation of his instructor in French 222. Advanced study of syntax; emphasis on special constructions of the French sentence. Analysis of the language of literary texts, magazine articles, and criticism. Practice in free composition and simple *explications de texte.* Prerequisite: Fr. 222 or the equivalent or consent of the instructor.

261. FRENCH ABROAD I. 0 TO 15 HOURS. Lectures, seminars, and practical work in French language, literature, and civilization in France. Prerequisites: Fr. 201, any one of Fr. 202, 203, 204, 205, any three of Fr. 211, 212, 221, 222, 3.500 overall average, and 3.500 average in French.

262. FRENCH ABROAD II. 0 TO 15 HOURS. Lectures, seminars, and practical work in French language, literature, and civilization in France. Prerequisite: Fr. 261.

263. FRENCH ABROAD III. 0 TO 15 HOURS. Lectures, seminars, and practical work in French language, literature, and civilization in France. Prerequisite: Fr. 262.

265. SOCIAL AND CULTURAL HISTORY. 3 HOURS. Social thought and the fine arts as background for the study of French literature. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents.

270. EDUCATIONAL PRACTICE WITH SEMINAR I. 8 HOURS. Same as Education 270. The first half of a practice teaching two-segment sequence, including seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Ed. 250, admission to advanced standing, and recommendation of the department of specialization.

271. EDUCATIONAL PRACTICE WITH SEMINAR II. 8 HOURS. Same as Education 271. The second half of a practice teaching two-segment sequence, including seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Ed. 250, credit of concurrent registration in Fr. 270, admission to or continuation of advanced standing, and recommendation of the department of specialization.

281. FRENCH PHONETICS. 3 HOURS. Two hours per week in the language laboratory are required. The International Phonetic Alphabet as applied to the French sound system. French pronunciation, intonation, rhythm, and stress are analyzed and practiced. Prerequisite: Fr. 106 or the equivalent.

291. STUDENT-INITIATED COURSE. 1 TO 4 HOURS. May be repeated. The amount of credit toward satisfying specific department requirements is contingent on the approval of the department committee. Special experimental seminar on topics not treated by regular course offerings. Students must activate this course themselves by directing their requests to the head of the department. Prerequisite: Fr. 106 or the equivalent.

299. TUTORIAL COURSE. 1 TO 6 HOURS. Amount of credit is designated by the department head. May be repeated for a maximum of 6 hours. For seniors majoring in French; supplements regular courses. Prerequisites: Senior standing and approval of the department.

301. STYLISTICS I: PROSE. 4 HOURS. Detailed analysis of the style of selected French authors; practice in advanced composition. Prerequisite: Fr. 222 or the equivalent or consent of the instructor.

302. STYLISTICS II: POETRY. 4 HOURS. Detailed analysis of the style of selected French authors; practice in advanced composition. Prerequisite: Fr. 222 or the equivalent or consent of the instructor.

311. SHORT PROSE FICTION. 4 HOURS. French prose narrative forms, excluding the novel, from the Renaissance to the present. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents, or consent of the instructor.

316. FRENCH POETRY I. 4 HOURS. Major poets from the fourteenth through the eighteenth centuries. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents, or consent of the instructor.

321. FRENCH LITERATURE OF THE MIDDLE AGES I. 4 HOURS. From the origins to 1300. Texts in modern French: *chansons de geste;* courtly romances (Chrétien de Troyes, et al.); *Roman de Renard,* and others. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents, or consent of the instructor.

322. FRENCH LITERATURE OF THE MIDDLE AGES II. 4 HOURS. The fourteenth and fifteenth centuries. Texts in modern French: chroniclers; lyric poetry; religious and comic drama. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents, or consent of the instructor.

323. HISTORY OF THE FRENCH LANGUAGE. 4 HOURS. From its origins to the present. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

332. FRENCH LITERATURE OF THE SIXTEENTH CENTURY. 4 HOURS. Major writers to be read in modern French: Marot, Scève, Rabelais, Ronsard, Du Bellay, Montaigne, and others. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

333. THE *PLÉIADE.* 4 HOURS. Theory and practices of the *Pléiade* poets: Ronsard, Du Bellay, Belleau, Baïf, Jodelle, Pontus de Tyard, Desportes, and others. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents, or consent of the instructor.

334. MONTAIGNE: HIS *ESSAIS* AND HIS AGE. 4 HOURS. Detailed study of Montaigne's life, thought, and times as reflected in the *Essais.* Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

341. SEVENTEENTH CENTURY FRENCH PROSE WRITERS. 4 HOURS. Reading and analysis of major prose writers: Descartes, Pascal, Bossuet, Mme. de Sévigné, La Bruyère, and others. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

342. SEVENTEENTH CENTURY FRENCH THEATER. 4 HOURS. Reading and analysis of major dramatists: Corneille, Molière, and Racine. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

344. SEVENTEENTH CENTURY FRENCH POETRY. 4 HOURS. Reading and analysis of major poets: Malherbe, Baroque poets, La Fontaine, and Boileau. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

345. THE SEVENTEENTH CENTURY FRENCH NOVEL. 4 HOURS. Reading and analysis of major novelists: d'Urfé, Sorel, Scarron, Cyrano, Mme. de Lafayette, *Les Lettres Portugaises,* and others. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

351. FRENCH LITERATURE OF THE EIGHTEENTH CENTURY I. 4 HOURS. Prose writers; reading and analysis of Lesage, Montesquieu, Diderot, Voltaire, Rousseau, and others. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

352. FRENCH LITERATURE OF THE EIGHTEENTH CENTURY II. 4 HOURS. Reading and analysis of major dramatists: Crébillon, Voltaire, Marivaux, Diderot, Beaumarchais, and others. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

353. LITERARY AND INTELLECTUAL CURRENTS OF THE EIGHTEENTH CENTURY. 4 HOURS. Reading and analysis of selected works tracing major literary and intellectual currents; Montesquieu, Voltaire, Rousseau, Diderot, and others. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

354. THE FRENCH NOVEL OF THE EIGHTEENTH CENTURY. 4 HOURS. Reading and analysis of selected novels of Prévost, Crébillon *fils*, Voltaire, Diderot, Rousseau, and others. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

359. PREROMANTICISM. 4 HOURS. The Preromantic movement in France from 1761 to 1814. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

360. *LA BATAILLE ROMANTIQUE.* 4 HOURS. Manifestos, polemical writings, and major literary productions of the period. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

361. FRENCH ROMANTICISM I. 4 HOURS. Reading and analysis of selected works tracing the main developments in the Romantic movement from 1815 to 1829; Hugo, Stendhal, Mérimée, Lamartine, Vigny, and others. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

362. FRENCH ROMANTICISM II. 4 HOURS. Reading and analysis of selected works tracing the main developments of the Romantic movement after 1830; Nerval, Baudelaire, Sand, Musset, Hugo, and others. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

363. THE FRENCH NOVEL OF THE NINETEENTH CENTURY I. 4 HOURS. Reading and analysis of major novelists: Chateaubriand, Senancour, Mme. de Staël, Constant, Lamartine, and others. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

364. THE FRENCH NOVEL OF THE NINETEENTH CENTURY II. 4 HOURS. Reading and analysis of major novelists: Stendhal, Balzac, Mérimée, George Sand, Flaubert, and others. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

365. THE FRENCH NOVEL OF THE NINETEENTH CENTURY III. 4 HOURS. Reading and analysis of major novelists: the Goncourt brothers, Zola, Maupassant, Loti, France, and others. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

366. FRENCH POETRY II. 4 HOURS. Major poets of the nineteenth century; Lamartine, Hugo, Musset, Vigny, Gautier, Baudelaire, Verlaine, Rimbaud, Mallarmé, and others. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

368. MODERN FRENCH DRAMA I. 4 HOURS. Major dramatists of the nineteenth and twentieth centuries; Hugo, Vigny, Musset, Dumas *fils*, Augier, Becque, and others. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

369. MODERN FRENCH DRAMA II. 4 HOURS. Continues French 368. Curel, Porto-Riche, Rostand, Claudel, Lenormand, and others. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

370. MODERN FRENCH DRAMA III. 4 HOURS. Continues French 368 and 369. Cocteau, Giraudoux, Anouilh, Sartre, Camus, Beckett, Ionesco, and others. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

371. FRENCH POETRY III. 4 HOURS. Major poets of the twentieth century; Jammes, Jacob, Apollinaire, Valéry, Eluard, Breton, Aragon, Perse, Michaux, Prévert, and others. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

372. THE FRENCH NOVEL OF THE TWENTIETH CENTURY I. 4 HOURS. Reading and analysis of selected novels by Gide, Proust, Mauriac, Colette, Cocteau, and others. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

373. THE FRENCH NOVEL OF THE TWENTIETH CENTURY II. 4 HOURS. Reading and analysis of selected novels by Malraux, Aragon, Saint-Exupéry, Céline, Giraudoux, and others. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

374. THE FRENCH NOVEL OF THE TWENTIETH CENTURY III. 4 HOURS. Reading and analysis of selected novels by Sartre, Camus, Robbe-Grillet, Sarraute, Butor, and other contemporary novelists. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

379. INTRODUCTION TO AFRO-FRENCH LITERATURE. 4 HOURS. Same as Black Studies 379. Selected prose and poetry of sub-Sahara African Francophone literature. Prerequisites: Fr. 201 and any two of Fr. 202, 203, 204, 205 or the equivalents or consent of the instructor.

381. INTRODUCTION TO LINGUISTICS. 4 HOURS. French phonology, morphology, syntax, and semantics in comparison with English. Prerequisites: Fr. 212, 222, 281 or the equivalents or consent of the instructor.

382. TEACHERS COURSE. 4 HOURS. Resources, classroom materials, standard practices, and problems in the teaching of French; practical application to actual classroom situations. Prerequisite: Fr. 381 or consent of the instructor.

390. PERSPECTIVES IN FRENCH LITERATURE. 4 HOURS. A synthesis of specialized knowledge previously acquired in various areas at the 300 level; a new perspective on French literature in its historical development, presented through representative works by major authors. Prerequisites: Senior standing, Fr. 201, and two of Fr. 202, 203, 204, 205 or the equivalents.

399. SEMINAR ON SELECTED TOPICS. 4 HOURS. May be repeated for credit. Specific movements, authors, or works. Topics are announced in the Timetable. Prerequisite: Senior standing and/or consent of the instructor.

GEOGRAPHY (Geog)

101. PHYSICAL GEOGRAPHY I: LANDFORMS AND MINERAL RESOURCES. 4 HOURS. The earth and its resources; the earth grid and its portrayal on maps; interpretation of landforms from a geographic point of view; occurrence and use of mineral resources.

102. PHYSICAL GEOGRAPHY II: EARTH-SUN RELATIONS AND ELEMENTS OF WEATHER. 4 HOURS. Planetary relations; the atmosphere, its composition, function, and behavior in the production of weather types; air masses and air mass analysis.

103. PHYSICAL GEOGRAPHY III: CLIMATE, VEGETATION, AND SOILS. 4 HOURS. Climatic types and climatic regions; factors that give order and logic to their areal distribution; biotic and edaphic types and regions in relation to climatic phenomena.

110. INTRODUCTION TO CULTURAL GEOGRAPHY. 4 HOURS. Introduction to the geographic patterns created by man's efforts to survive within his environmental constraints. Attention is given to man's origin, divergence, and convergence in historical perspective. Special reference is made concerning man himself as well as the manifestations on the earth's surface of his varied attitudes, objectives, and technical skills.

120. INTRODUCTION TO BEHAVIORAL GEOGRAPHY. 4 HOURS. Study of human behavior with respect to environmental qualities. A theoretical approach through psychogeography, ethnogeography, and cultural microgeography to examine how human beings in varying times and cultures come to understand, evaluate, and utilize the earth's surface. Models are developed to explain and help

resolve a variety of man-environment problems, ranging from the earliest civilizations to the contemporary world.

130. WORLD PATTERNS OF PRODUCTION. 4 HOURS. Man's utilization of the major economic resources of the world from the standpoint of geographic patterns and the utilization of resources.

160. WORLD REGIONAL GEOGRAPHY. 5 HOURS. Geographic structure of the world; regional patterns of settlement and land utilization of resources.

161. GEOGRAPHY OF ILLINOIS. 4 HOURS. Detailed regional study of the state; special emphasis on the cultural relations of Illinois to the rest of the nation. Prerequisite: One course in geography or consent of the instructor.

182. INTRODUCTION TO GEOGRAPHIC RESEARCH METHODS. 4 HOURS. Description, hypothesis testing, and theory formulation as major tools in geographic research; emphasis on useful analytical techniques. The fundamentals of sampling, statistics, probability, and data processing as applied to spatial problems.

185. BASIC MAPS AND GRAPHICS. 4 HOURS. Introductory course on the use of maps and other graphic materials. Demonstration and evaluation of slides, films, prints, models, and maps for teaching and other purposes. Prerequisite: Declared major in a teacher education program.

190. CONCEPTS IN GEOGRAPHY. 4 HOURS. Basic geographic concepts, including the notions of spatial distributions, areal association, spatial interaction, and regionalism.

199. FRESHMAN HONORS COURSE IN GEOGRAPHY. 2 HOURS. The basic applications of geography as a social and behavioral science. Subject matter varies, depending upon request, need, and interest. Prerequisites: Freshman standing, James Scholar or other honors designation approved by the University Honors Programs.

201. LANDFORM GEOGRAPHY OF THE UNITED STATES. 4 HOURS. The variation of the earth's surface form in the United States and the related distributional aspects of geomorphic processes, vegetation, and soils. Readings and individual projects are required. Credit in Geography 101 is recommended.

203. CLIMATES OF THE CONTINENTS. 4 HOURS. The world's climates; controls and distribution; problems of classification and regional analysis. Credit in Geography 103 is recommended.

208. MAN AND THE PHYSICAL ENVIRONMENT. 4 HOURS. Man's place in the world ecosystem is analyzed as an aspect of man-land relationships. Pollution of the physical environment is discussed in technical, social, and philosophical terms. Implications of environmental planning and control are reviewed. Group research projects and reports are required.

209. INTRODUCTION TO ASTRONOMY. 4 HOURS. Same as Physics 209. An introductory and essentially non-mathematical course for superior students who are not science majors. Prerequisite: Consent of the instructor.

210. SPATIAL ORGANIZATION IN SOCIAL AND CULTURAL GEOGRAPHY. 4 HOURS. Major geographic problems related to understanding spatial processes in

relationship to social and cultural areas, landscapes, histories, and ecology. Credit in Geography 110 or 8 hours of either anthropology, economics, history, political science, or sociology is recommended.

215. HISTORICAL GEOGRAPHY OF THE UNITED STATES AND CANADA. 4 HOURS. Regional analysis of the effects of climate, soils, water bodies, and topography on the settlement of the continent; their relationship to present sectional differences; the correlation of history and geography is stressed. Credit in Geography 110 or 8 hours of either anthropology, economics, history, political science, or sociology is recommended.

217. WORLD POLITICAL PATTERNS. 4 HOURS. World patterns of nations in relation to their natural environment; population and economic factors in world affairs; emphasis on regional concepts and problems of the non-Western World. Credit in Geography 110 or 8 hours in anthropology, economics, history, political science, or sociology is recommended.

220. MIND AND ENVIRONMENT. 4 HOURS. Models and theories concerning the relationship between psychological processes and the environment; major philosophical models, ancient and modern; major scientific theories developed in geography, psychology, anthropology, and other fields; new insights into the role of cognition and values in such aspects of environmental behavior as locational decision making, geographic learning, and the ethics of conservation. Prerequisite: Geog. 120 or 8 hours of geography and 4 hours of either anthropology or psychology.

226. MANAGEMENT AND CONSERVATION OF RESOURCES. 4 HOURS. Introduction to natural resource problems arising from the growth of population, change in taste and technology, and concern with the quality of the environment. Individual readings and projects are assigned. Credit in Geography 130 or 8 hours of either anthropology, economics, history, political science, or sociology is recommended.

230. AREAL ORGANIZATION OF ECONOMIC ACTIVITIES. 4 HOURS. Models relating to the spatial elements of activities with application to urban and regional growth and development. Credit in Geography 130 or 8 hours of either anthropology, economics, history, political science, or sociology is recommended.

231. AGRICULTURAL GEOGRAPHY. 4 HOURS. The nature of land utilization from the world, continental, and regional viewpoints; the types of agricultural land use; the interrelationship between areas of different types of land use. Credit in Geography 130 or 8 hours in anthropology, economics, history, political science, or sociology is recommended.

233. MANUFACTURING GEOGRAPHY. 4 HOURS. World distribution of manufacturing industries. The relative importance of industry in the major economies of the world; factors in the location of principal types of manufacturing; detailed analysis of selected industrial districts. Credit in Geography 130 or 8 hours of either anthropology, economics, history, political science, or sociology is recommended.

235. GEOGRAPHIC ASPECTS OF TRANSPORTATION. 4 HOURS. Principles; world patterns of land, air, and sea transportation routes, facilities, and traffic; relations of transportation to regional development; selected problems in the geographic aspects of railway, highway, and pipeline transportation. Individual projects and readings are assigned. Credit in Geography 130 or 8 hours of either anthropology, economics, history, political science, or sociology is recommended.

250. THE GEOGRAPHY OF CITIES. 4 HOURS. World cities and comparative urbanization. Intensive exposure to the development and pattern of urbanization; the growth of major integrating centers of political and economic power; the world cities. Credit in two upper-level systematic geography courses is recommended.

255. SETTLEMENT GEOGRAPHY. 4 HOURS. Examination of the spatial manifestations of man's attempts to survive in the preindustrial world; settlement patterns as the products of man's perceptions of his natural sourroundings and the controls placed on their use by institutions. Problems of the contemporary rural portions of the earth. Credit in two upper-level systematic geography courses is recommended.

260. ANGLO-AMERICA. 4 HOURS. Survey of the principal economic activities in each of the major regions of North America from the standpoint of their relations to the natural environment and to the other major regions. One Saturday field trip may be required. Credit in Geography 160 or two 200-level systematic geography courses is recommended.

261. SOCIAL AND CULTURAL GEOGRAPHY OF THE UNITED STATES. 4 HOURS. Regional examination of social structure in major cultural areas. Emphasis on areas in which unique social and cultural patterns remain dominant and on areas in which cultural conflicts act as barriers to acculturation. Credit in Geography 210 or 260 is recommended.

262. MIDDLE AMERICA. 4 HOURS. Same as Latin American Studies 215. Physical landscapes and the human cultural, economic, and political responses to them in Mexico, Central America, and the West Indies. Prerequisite: Geog. 160 or two 200-level systematic geography courses.

263. SOUTH AMERICA. 4 HOURS. Same as Latin American Studies 216. Regional geography; physical regions, people, economic resources, and political alignments. Prerequisite: Geog. 160 or two 200-level systematic geography courses.

264. WESTERN EUROPE. 4 HOURS. A regional analysis of the economic, social, and political development of people in relation to the location of Europe and its natural regions and the physical elements of land relief, climate, soil, and other natural resources. Emphasis on Britain, France, and Germany. Credit in Geography 160 or two 200-level systematic geography courses is recommended.

265. THE U.S.S.R. 4 HOURS. Physical and cultural landscapes; regional analysis of resources and economy; the geographic basis of the nation's role in world affairs. Credit in Geography 160 or two 200-level systematic geography courses is recommended.

266. EASTERN ASIA. 4 HOURS. Physical and cultural landscapes of China, Japan, and Korea; physical regions, people, economy, and political alignments. Credit in Geography 160 or two 200-level systematic geography courses is recommended.

267. SOUTHERN AND SOUTHEASTERN ASIA. 4 HOURS. Physical and cultural landscapes; physical regions, people, mineral wealth, agricultural production, manufacturing, trade, political alignments. Credit in Geography 160 or two 200-level systematic geography courses is recommended.

268. AFRICA SOUTH OF THE SAHARA. 4 HOURS. Regional analysis of the relationship between natural resources, economic development, and the evolution

of the many political units. Credit in Geography 160 or two 200-level systematic geography courses is recommended.

269. NORTH AFRICA AND THE MIDDLE EAST. 4 HOURS. A human and physical spatial analysis of Saharan and Mediterranean Africa, the Levant, the Red Sea, and Persian Gulf lands, including countries south of the Caspian Sea from Turkey to Baluchistan. Emphasis on population-resource problems and cultural conflict. Credit in Geography 160 or two 200-level systematic geography courses is recommended.

270. EDUCATIONAL PRACTICE WITH SEMINAR I. 8 HOURS. Same as Education 270. The first half of a practice teaching two-segment sequence, including seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Ed. 250, admission to advanced standing, and recommendation of the department of specialization.

271. EDUCATIONAL PRACTICE WITH SEMINAR II. 8 HOURS. Same as Education 271. The second half of a practice teaching two-segment sequence, including seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Ed. 250, credit or concurrent registration in Geog. 270, admission to or continuation of advanced standing, and recommendation of the department of specialization.

280. FIELD GEOGRAPHY. 4 HOURS. Field techniques based on observation of physical and cultural landscapes of the Chicago metropolitan area, northern Illinois, and southern Wisconsin. Class meets on seven selected Saturdays from 8 a.m. to 4 p.m. Prerequisites: Geog. 101, 102, 103 or Geog. 110, 120, 130; Geog. 190 and one two-course sequence.

285. A PROBLEMATIC APPROACH TO CARTOGRAPHY. 4 HOURS. Introduction to the problems and practices of cartographic display of areal data. Topics include characteristics of maps, symbolization, and the introduction of some potentials for computer usage in map preparation. Prerequisite: Declared geography major or consent of the instructor.

286. MAP INTERPRETATION. 4 HOURS. Historical development of maps; survey of selected United States and foreign map series; evaluation of map components; critical analysis of data portrayal schemes; methods of making measurements on maps. Prerequisite: Declared geography major or consent of the instructor.

287. AERIAL-PHOTO INTERPRETATION. 4 HOURS. The aerial photograph as a geographic research tool. Applications of data-gathering techniques to problems involving agriculture, ecology, forestry, geology, industry, pollution, and urban land use. Prerequisite: Declared geography major or consent of the instructor.

291. STUDENT-INITIATED COURSE IN GEOGRAPHY. 1 TO 3 HOURS. A special and variable course designed to meet specific needs that are not available in other course offerings. The approval of course topics and the number of registrations required is decided by the head of the department. Prerequisite: Consent of the instructor.

299. SPECIAL STUDIES IN GEOGRAPHY. 2 TO 5 HOURS. May be repeated twice for a total of 10 hours. Readings and reports in selected fields chosen in consultation with the instructor. Prerequisite: Consent of the instructor.

301. ADVANCED LANDFORM GEOGRAPHY. 4 HOURS. Examination of the surficial processes modifying the earth's landforms; the controls over those processes and their regional settings. Prerequisites: Geog. 190 and 201 or consent of the instructor.

303. PRINCIPLES OF CLIMATOLOGY. 4 HOURS. Climatology; macroclimatology and microclimatology; particular emphasis on fluxes of energy and mass at the interfaces between the earth's surface and the atmosphere. The environment and man, plants, and animals; special emphasis on urban microclimatological problems. Prerequisites: Geog. 190 and 203 or consent of the instructor.

306. FUNDAMENTALS OF LANDFORM ANALYSIS. 3 HOURS. Theories of landform processes and techniques of analysis. Prerequisite: Geog. 101 or GeolS. 102 or consent of the instructor.

310. PRINCIPLES OF CULTURAL AREA ANALYSIS. 4 HOURS. Prerequisites: Geog. 190 and 210.

311. GEOGRAPHY OF POPULATION. 4 HOURS. Broad treatment of the problems created by the changing distributions and numbers of the world's population. Emphasis on the relationships between population and resources; intensive study of the implications for both overpopulated and underpopulated areas of the world. Prerequisites: Geog. 190 and 210.

312. GEOGRAPHY OF RELIGIONS. 4 HOURS. Same as Religious Studies 312. Systematic treatment of geographical manifestations of the major religious systems of the world. Special attention to the geographical origins and dispersal mechanisms of religious systems and to the manner in which man organizes his life within the framework of his belief. Intensive study of applications being made in the geographical inquiry of religious systems. Prerequisites: Geog. 190 and 210.

315. PRINCIPLES OF HISTORICAL GEOGRAPHY. 4 HOURS. Development of an understanding of relating phenomena in space through time. Application of contemporary geographic research methodologies to geographically significant aspects of historic patterns and events. Prerequisites: Geog. 190 and 215.

320. ETHNOGEOGRAPHY. 4 HOURS. Cross-cultural analysis of environmental behavior and environmental cognition (ethnoscience), of the systems of resource-use in which these processes are imbedded, and of their relationship to cultural change and technological growth. Prerequisites: Geog. 220 and Anth. 200 or consent of the instructor.

326. DECISION MAKING AND RESOURCE MANAGEMENT. 4 HOURS. The nature of decision-making schema in resource management; intensive study of approaches used in analyzing resource management decisions; case studies are analyzed in terms of the character of decisions and strategies reflected with emphasis on environmental hazards. Prerequisites: Geog. 190, 226.

330. LOCATION THEORY AND SPATIAL ANALYSIS. 4 HOURS. Spatial analysis in relation to theories of location of economic activity and regional development; theoretical systems; development and derivation of locational patterns of agricultural, manufacturing, and tertiary activities. Prerequisites: Geog. 190 and one course chosen from Geog. 230, 231, 233, or 235 or Econ. 121 or Mktg. 360.

335. GEOGRAPHIC MODELING OF TRANSPORTATION SYSTEMS. 4 HOURS. Discussion of the principles of spatial interaction; emphasis on commodity flows

and passenger movements, the practicality of network analysis, and the impact of transportation facilities on land use and regional development. Techniques include simulation and evaluation of existing transportation systems and solutions to theoretical transportation problems. Prerequisite: Geog. 235 or 383.

350. AREAL ORGANIZATION OF URBAN SYSTEMS I. 4 HOURS. Geographic aspects of intracity relationships. Topics include the city as a complex man-machine system, and areal patterns of urban growth and development within the context of cross-sectional and longitudinal models. Prerequisites: One upper-division research methods course, one two-course systematic sequence, and one course in the 250 series or one course in the 360 series.

351. AREAL ORGANIZATION OF URBAN SYSTEMS II. 4 HOURS. Geographic aspects of intercity relationships. Topics include patterns of intercity flows and development, continuous and hierarchical ordering of urban places, measurement of areal alignments, and the theoretical implications of different types of areal patterns. Prerequisites: One upper-division research methods course, one two-course systematic sequence, and one course in the 250 series or one course in the 360 series.

361. PROBLEMS OF THE HUMID TROPICS. 4 HOURS. Natural and human aspects of tropical areas; problems of the humid environment relating to landforms, land use, resources, economic and social phenomena and institutions; emphasis on the development potential of humid, tropical lands. Individual research projects are assigned. Prerequisites: One upper-division research methods course, one two-course systematic sequence, and one course in the 260 series or one course in the 350 series.

362. PROBLEMS OF ARID REGIONS. 4 HOURS. Natural and human aspects of arid areas; problems of the arid environment relating to landforms, land use, resources, and economic and social phenomena and institutions; emphasis on the development potential of arid lands. Individual research projects are assigned. Prerequisites: One upper-division research methods course, one two-course systematic sequence, and one course in the 260 series or one course in the 350 series.

365. INTERREGIONAL EXCHANGE DYNAMICS. 4 HOURS. Spatial analysis of the economic, social, and political facts that have resulted from, and in, human and commodity flows among regions; special attention to the important relationships resulting from regional differences. Prerequisites: One upper-division research methods course, one two-course systematic sequence, and one course in the 260 series or one course in the 350 series.

369. FIELD GEOGRAPHY OF SELECTED WORLD REGIONS. UNDERGRADUATE, 12 HOURS. GRADUATE, 6 HOURS. May be applied only once toward degree requirements. A full-quarter field course covering a selected geographic region of the world. Lecturers, discussions, special readings, projects, and field work are integral parts of the course. Prerequisites: *Geography majors*—Geo. 190, two 200-level systematic geography courses, and consent of the instructor; *others*—one year of upper-level social science courses and consent of the instructor.

370. THE LEARNING AND TEACHING OF GEOGRAPHY. 4 HOURS. A formal approach to instructional strategies in geography centered around the known behavioral and learning characteristics of students. Strong emphasis on material

presentation in contemporary urban schools. Prerequisites: Senior standing and declared major in teacher education.

381. GEOGRAPHIC INFORMATION SYSTEMS I. 4 HOURS. Problems encountered in the gathering and use of geographic data and the structuring of research within the light of existing relevant theory, measurement systems capabilities, and recognized objectives of research activities. Topics include review of data sources, methods of measurement, sampling models, and problems of dealing with aggregated reporting units, records matching, and missing data. Prerequisites: Geog. 182, 190 (or Math. 117, or Soc. 185, or QM 272), one 12-hour introductory sequence, and one 8-hour systematic sequence.

382. GEOGRAPHIC INFORMATION SYSTEMS II. 4 HOURS. Application of inferential statistical techniques and probability models in geographic research. Topics include use of descriptive parameters in recognizing geographic relationships, tests of significance, and recognition of particular areal patterns. Prerequisite: Geog. 381 or consent of the instructor.

383. GEOGRAPHIC INFORMATION SYSTEMS III. 4 HOURS. Problems encountered in the management and portrayal of geographic data. Topics include preparation of data for manual and machine processing, data condensation and characterization, observation indexing, and the preparation of graphic and tabular displays. Prerequisite: Geog. 382 or consent of the instructor.

385. THEMATIC CARTOGRAPHY. 4 HOURS. Discussion and experiments involving graphic representation of real-world areal patterns; preservation of geodetic and information properties; information generalization and reconstruction; semiotic problems and communications capabilities of mapped informational displays. Prerequisites: Geog. 285 or 382 and consent of the instructor.

386. INTRODUCTION TO AREAL PATTERNS. 4 HOURS. Introduction to the characteristics and evaluation of selected real-world patterns. Application of the notions of randomness and interdependence to the problem of understanding certain of the physical and cultural processes affecting the arrangement of objects in the landscape. Prerequisites: Geog. 286 or 382 and consent of the instructor.

387. REMOTE SENSING OF THE ENVIRONMENT. 4 HOURS. Principles and practice in interpretation of aerial photographs, radar, and infrared imagery. Knowledge of elementary physics and geometry is recommended. Prerequisite: Geog. 287 or consent of the instructor.

391. REVIEW OF GEOGRAPHIC THOUGHT AND RESEARCH METHODS. 4 HOURS. Introduction to the theory and technique of geographic research; modern geographic philosophy; interpretative analysis of bibliographic sources and the preparation of a bibliography; preparation and evaluation of individual papers on selected topics. Prerequisites: Two two-course systematic sequences: one upper-division research methods course, one 300-level urban or regional course, and consent of the instructor.

GEOLOGICAL SCIENCES (GeolS)

101. PRINCIPLES OF GEOLOGY I. 5 HOURS. Analysis of the earth's surficial features: weathering and erosion, soils, groundwater, glaciers, streams, oceans and shorelines, deserts. Half-day Saturday field trip required.

102. PRINCIPLES OF GEOLOGY II. 5 HOURS. The origin, age, and composition of the earth; introduction to rocks and minerals; metamorphism, magmatic evolution, isostasy, earthquakes, geophysical considerations of the earth's interior.

103. PRINCIPLES OF GEOLOGY III. 5 HOURS. Geological history and evolution of the earth and its life; geosynclinal theory, uniformitarianism, methods of interpreting earth history. One all-day Saturday field trip required. Prerequisites: GeolS. 101 and 102 or consent of the instructor.

110. FIELD WORK. 3 HOURS. Observation in the St. Francois Mountains and adjacent parts of Missouri and Illinois. Registration, winter quarter; two three-hour class meetings, held during spring vacation. Credit is given on completion of a satisfactory written report. Prerequisite: GeolS. 102.

111. PRINCIPLES OF GEOLOGY. 1 HOUR. For honors students. May be taken three times, each time with concurrent registration in Geological Sciences 101, 102, or 103 or once with concurrent registration in Geological Sciences 150. Prerequisite: Concurrent registration in the honors section of GeolS. 101, 102, 103 or 150 or consent of the instructor.

122. NATURAL SCIENCES—THE EVOLVING EARTH. 4 HOURS. Same as Natural Sciences 102. The concept of time in geology: the composition, structure, and evolution of the earth. Two or three all-day Saturday field trips are required. Prerequisite: NatS. 101 or consent of the instructor.

150. GEOLOGY FOR ENGINEERS. 4 HOURS. Application of elementary geology to engineering. Prerequisite: Sophomore standing in the College of Engineering.

200. INTRODUCTION TO MINERALOGY. 5 HOURS. Geometrical crystallography. Optical mineralogy. Identification of mineral specimens. X-ray diffraction techniques. Prerequisite: Credit or registration in Chem. 112.

210. INTRODUCTION TO PETROLOGY. 4 HOURS. Structure, crystal chemistry, and identification of important groups. Discussion of rock-forming processes; emphasis on physical-chemical aspects. Prerequisites: GeolS. 200 and credit or registration in Chem. 113.

215. ANALYSIS OF SEDIMENTARY ROCKS. 4 HOURS. Survey of sedimentation processes; stratigraphic principles and methods of interpreting sedimentary rocks. Laboratories include flume, X-ray, and petrographic techniques used in analyzing sedimentary materials. Prerequisites: GeolS. 200 and credit or registration in Chem. 113.

217. FIELD GEOLOGY. 6 TO 8 HOURS. Introduction to field methods at a summer field camp in the Black Hills of South Dakota. Mapping with plane table and aerial photographs. Each student prepares a complete report which includes geologic maps, stratigraphical and structural sections, and a discussion of tectonics, geomorphology, and igneous and metamorphic petrology. Approximate cost, $350. Prerequisites: GeolS. 103 and consent of the instructor.

218. INTRODUCTION TO PALEONTOLOGY. 4 HOURS. Same as Biological Sciences 218. The phylogeny, morphology, and ecology of fossils; emphasis on the invertebrates. Two or three Saturday field trips are required. Prerequisite: One year of biological sciences or GeolS. 103 and consent of the instructor.

225. INTRODUCTION TO ENVIRONMENTAL GEOLOGY. 4 HOURS. Introduction to geological aspects of man's impact on environment; geobiocoenose, geologic hazards, earth's resources and processes, geological aspects of environmental health. Prerequisites: Two quarters of any of the physical sciences or consent of the instructor.

230. INTRODUCTION TO OCEANOGRAPHY. 4 HOURS. A physical description of the marine environment: physical and chemical properties of sea water, currents, wave action, tidal forces, geography and geology of the ocean basins. Relation of the marine organism to the physical environment. Prerequisite: Consent of the instructor.

235. ASTROGEOLOGY. 4 HOURS. Data and major theories of the origin and evolution of the universe, solar system, and earth; lunar geology, meteors and meteorites, artificial satellite data. Prerequisite: One year of a physical science or consent of the instructor.

240. ECONOMIC GEOLOGY. 4 HOURS. Principles and techniques of mineral exploration, evaluation, and exploitation. Origin and occurrence of economic mineral materials, including petroleum and natural gas. Prerequisite: Consent of the instructor.

250. EVOLUTION OF THE EARTH. 4 HOURS. The earth's origin and the evolution of its major spheres and crustal features; continental drift, continental decretion, seafloor spreading, paleomagnetism, isostasy, mantle convection. Prerequisite: One year of either a physical science or mathematics.

299. INTRODUCTION TO RESEARCH. CREDIT TO BE ARRANGED. Independent study. Each student who desires to register must present to the head of the department a written statement from the instructor under whom he is to work. Only those students who write a thesis are recommended for graduation with departmental distinction. Prerequisite: Consent of the instructor.

300. MINERALOGY. 4 HOURS. Crystal chemistry and phase equilibria of minerals and mineral assemblages. Prerequisites: Chem. 114 and GeolS. 210.

310. IGNEOUS AND METAMORPHIC PETROLOGY. 4 HOURS. Discussion of petrogenesis; application of thermodynamic principles to the crystallization of rocks. Prerequisites: Chem. 114 and GeolS. 210.

315. SEDIMENTOLOGY. 4 HOURS. Composition, texture, and structures of sediments and sedimentary rocks. Environmental factors which control sediment genesis. Theory and techniques of modern sedimentology. Prerequisites: Chem. 114, GeolS. 215, and credit or registration in Math. 131.

316. INVERTEBRATE PALEONTOLOGY. 4 HOURS. Same as Biological Sciences 316. Phylogeny, morphology, and ecology of the fossil invertebrates. Prerequisites: GeolS. 218 and consent of the instructor.

318. VERTEBRATE PALEONTOLOGY. 4 HOURS. Same as Biological Sciences 318. Phylogeny, morphology, and ecology of the fossil vertebrates. Prerequisites BioS. 281 and consent of the instructor.

319. PALEOBOTANY. 5 HOURS. Same as Biological Sciences 319. Structure, phylogeny, and stratigraphic distribution of representative fossil plants. Lecture, laboratory, and field trips. Prerequisite: One year of biological sciences.

320. ANALYSIS OF GEOLOGIC STRUCTURES. 4 HOURS. Elementary stress and strain relations for earth materials. Nature and origin of folds and faults. Structural petrology. Deformation of the earth's crust. Prerequisites: Math. 130 and credit or registration in Phys. 101 or 111.

330. ENVIRONMENTAL GEOLOGY. 4 HOURS. Geological aspects of man's environment; emphasis on the earth's processes, resources, and physical properties of rocks and soils insofar as they are important to, or in some way affect, human activities. Prerequisites: Credit or concurrent registration in Math. 132 and GeolS. 225 or consent of the instructor.

335. GEOCHEMISTRY. 4 HOURS. Principles of the distribution of the elements in the earth's crust. Element partitioning between coexisting minerals; origin of the elements. Introduction to thermodynamic considerations of mineral equilibria. Prerequisites: Chem. 112, 113, and 114 or consent of the instructor.

337. ELECTRON MICROPROBE ANALYSIS. 4 HOURS. Principles and techniques of electron-probe microanalysis. Prerequisite: Phys. 114 or the equivalent or consent of the instructor.

345. ADVANCED CRYSTALLOGRAPHY. 4 HOURS. Crystalline properties of minerals. Theory and practice of determining the crystalline structure of minerals. Prerequisite: GeolS. 300.

350. HYDROGEOLOGY. 4 HOURS. The occurrence, storage, movement, and quality of water in rocks of the earth's crust. Prerequisites: Credit or concurrent registration in GeolS. 215 and Math. 132 or consent of the instructor.

360. INTRODUCTORY GEOPHYSICS. 4 HOURS. The shape and figure of the earth, gravity, seismology, and magnetism. Thermodynamics of the earth; atmospheric and planetary geophysics. Prerequisite: Consent of the instructor.

365. STATISTICAL METHODS IN GEOLOGY. 4 HOURS. Introductory course. Sampling from geological populations, statistical inference, and hypothesis testing; statistics of orientation data; trend surface methods; multivariate correlation techniques; time series analysis. Prerequisite: Math. 370 or consent of the instructor.

370. ENGINEERING GEOLOGY. 4 HOURS. Applications of geology to major engineering problems and operations. Prerequisites: Math. 132 and Phys. 112 or consent of the instructor.

375. COMPUTER APPLICATIONS IN GEOLOGY. 4 HOURS. Introduction to computer applications in geology. Machine contouring, trend surface analysis, and spatial filtering. Graphic correlation, factor analysis, and classification systems. Simulation of geological processes, geologic sampling, and spatial variation. Prerequisite: Math. 195 or consent of the instructor.

385. GEOPHYSICAL EXPLORATION. 4 HOURS. Introduction to methods of geophysical exploration. Interpretation of seismic data, gravity and magnetic anomalies, and electrical and electromagnetic surveys. Laboratory includes field investigations. Prerequisites: Math. 133 and GeolS. 360 or consent of the instructor.

390. TOPICS IN MODERN GEOLOGY. 4 HOURS. Discussion of current research topics. Prerequisites: Senior standing and 20 hours of advanced courses in geological sciences.

GERMAN (Ger)

100. ELEMENTARY GERMAN, SPECIAL COURSE. 4 HOURS. A one-quarter review course for students who have had high school German, but whose scores on the placement test indicate that their previous preparation is too weak for German 104 and too strong for German 101. Open also to transfer students who have had no more than one year of college German and whose scores on the placement test indicate that their previous preparation is too weak for German 104. This course is followed by German 104 and any two of German 105, 106, 107, 108, 109, 110. Prerequisite: German placement test.

101. ELEMENTARY GERMAN I. 4 HOURS. Four class meetings per week plus language laboratory experience. A nonintensive sequence designed primarily to satisfy the foreign language requirement, but open to all students. Introduction to and practice in speaking, understanding, reading, and writing.

102. ELEMENTARY GERMAN II. 4 HOURS. Continues German 101. Prerequisite: Ger. 101 or 121 or the equivalent.

103. ELEMENTARY GERMAN III. 4 HOURS. Continues German 101 and 102. Prerequisite: Ger. 102 or 122 or the equivalent.

104. INTERMEDIATE GERMAN. 4 HOURS. Training in reading skills and review of grammar. Discussions in German. Prerequisite: Ger. 100 or 103 or 123 or the equivalent.

105. NONFICTION READINGS; ENGLISH DISCUSSION. 4 HOURS. May be taken before or after any one of German 106, 107, 108, 109, or 110 in fulfillment of the foreign language requirement. Contemporary life and civilization. Discussions in English. Prerequisite: Ger. 104 or 124 or the equivalent.

106. LITERARY READINGS; GERMAN DISCUSSION. 4 HOURS. May be taken before or after any one of German 105, 107, 108, 109, or 110 in fulfillment of the foreign language requirement. Contemporary writers. Discussions in German. Prerequisite: Ger. 104 or 124 or the equivalent.

107. NONFICTION READINGS; GERMAN DISCUSSION. 4 HOURS. May be taken before or after any one of German 105, 106, 108, 109, or 110 in fulfillment of the foreign language requirement. Contemporary life and civilization. Discussions in German. Prerequisite: Ger. 104 or 124 or the equivalent.

108. LITERARY READINGS; ENGLISH DISCUSSION. 4 HOURS. May be taken before or after any one of German 105, 106, 107, 109, or 110 in fulfillment of the foreign language requirement. Contemporary writers. Discussions in English. Prerequisite: Ger. 104 or 124 or the equivalent.

109. READINGS IN THE HERITAGE OF GERMAN CULTURE AND HISTORY. 4 HOURS. May be taken before or after any one of German 105, 106, 107, 108, or 110 in fulfillment of the foreign language requirement. Discussions in English. Prerequisite: Ger. 104 or 124 or the equivalent.

110. CONVERSATION. 4 HOURS. May be taken before or after any one of German 105, 106, 107, 108, or 109 in fulfillment of the foreign language requirement. Training in speaking skills with special emphasis on practical situations and traveler's vocabulary. Prerequisite: Ger. 104 or 124 or the equivalent.

121. ELEMENTARY GERMAN I. 5 HOURS. Four class meetings per week plus language laboratory experience. A more intensive sequence to satisfy the foreign language requirement, designed primarily for German majors, minors, teaching majors, James Scholars (counts as honors course), and other students with special aptitude and interest in language. Introduction to and practice in speaking, understanding, reading, and writing. Prerequisite: Satisfactory score on Linguistic Aptitude Test (administered in class during the first week of the quarter).

122. ELEMENTARY GERMAN II. 5 HOURS. Continues German 121. Prerequisite: Ger. 121, or 101 with a grade of A or B, or approval of the department.

123. ELEMENTARY GERMAN III. 5 HOURS. Continues German 121 and 122. Prerequisite: Ger. 122, or 102 with a grade of A or B, or approval of the department.

124. INTERMEDIATE GERMAN I. 5 HOURS. Four class meetings per week plus language laboratory experience. A more intensive sequence to satisfy the foreign language requirement, designed primarily for German majors, minors, teaching majors, James Scholars (counts as honors course), and other students with special aptitude and interest in language. Continues practice in speaking, understanding, reading, and writing. Prerequisite: Ger. 123 or 100 or 103 with a grade of A or B, or approval of or placement by the department.

125. INTERMEDIATE GERMAN II. 5 HOURS. Continues German 124. Prerequisite: Ger. 124 or 104 with a grade of A or B, or approval of the department.

126. INTERMEDIATE GERMAN III. 5 HOURS. Continues German 124 and 125. Prerequisite: Ger. 125 or approval of the department.

185. MASTERPIECES OF GERMAN LITERATURE IN ENGLISH TRANSLATION. 4 HOURS. Same as Humanities 185. Not open to German majors.

190. FRANZ KAFKA. 4 HOURS. Same as Humanities 190. Major works and short stories in English translation.

191. BERTOLT BRECHT. 4 HOURS. Same as Humanities 191. Major works in English translation.

192. HERMANN HESSE. 4 HOURS. Same as Humanities 192. Major works in English translation.

195. GOETHE'S WORKS IN TRANSLATION. 4 HOURS. Same as Humanities 195. *Faust* and other representative writings in English translation.

196. MAJOR WORKS OF SCHILLER IN ENGLISH TRANSLATION. 4 HOURS. Same as Humanities 196. Lectures and discussions on Schiller's dramas and aesthetic treatises.

201. WRITING AND SPEAKING GERMAN I. 4 HOURS. Phonetics, grammar, syntax, vocabulary development; training in oral and written communication. Prerequisite: Ger. 126 or any two of Ger. 105, 106, 107, 108, 109, 110 or the equivalent.

202. WRITING AND SPEAKING GERMAN II. 4 HOURS. Continues German 201. Prerequisite: Ger. 201 or the equivalent.

203. WRITING AND SPEAKING GERMAN III. 4 HOURS Continues German 202. Prerequisite: Ger. 202 or the equivalent.

204. WRITING AND SPEAKING GERMAN IV. 4 HOURS. Continues German 203. Prerequisite: Ger. 203 or the equivalent.

206. CORRECTIVE GERMAN PHONETICS. 1 HOUR. May be repeated once for credit. Pronunciation and intonation practice. Prerequisite: Ger. 126 or any two of Ger. 105, 106, 107, 108, 109, 110 or the equivalent.

207. GERMAN GRAMMAR FOR TEACHERS. 4 HOURS. Intensive study and review of problems of German grammar and syntax. Prerequisite: Ger. 204 or the equivalent or consent of the instructor.

220. GERMAN CULTURE AND CIVILIZATION. 4 HOURS. Survey of the development of German culture from earliest times to the present: art, architecture, music, society. Lectures, selected readings, and slides. Prerequisite: Ger. 126 or any two of Ger. 105, 106, 107, 108, 109, 110 or the equivalent.

221. INTRODUCTION TO GERMAN LITERATURE. 4 HOURS. A linguistic and literary introduction to the various genres. Prerequisite: Ger. 126 or any two of Ger. 105, 106, 107, 108, 109, 110 or the equivalent.

230. CONTRASTIVE APPLIED LINGUISTICS. 3 HOURS. German phonology, morphology, syntax, and semantics in comparison with English. Prerequisite: Ger. 202 or the equivalent.

233. STUDENT-INITIATED COURSE. 1 TO 4 HOURS. May be repeated for credit. Topics vary and are determined by the student or students who also draw up the specific proposal, which is then considered by the faculty of the department. Prerequisites: Ger. 290, 292, and 294 or the equivalents.

240. THE TEACHING OF GERMAN IN THE SECONDARY SCHOOL AND COLLEGE. 4 HOURS. Modern techniques, including the use of the language laboratory, in teaching German. Prerequisite: Ger. 230.

250. READING GERMAN I. 4 HOURS. Not open to German majors. May not be taken for credit by students who have completed the regular elementary and intermediate German language sequences. An accelerated course for beginners; designed to prepare students for reading examinations in German. Primarily for upper division and graduate students in other departments. Reading of specialized texts in the humanities, social sciences, and natural sciences. Does not meet graduation requirements in foreign language.

251. READING GERMAN II. 4 HOURS. Continues German 250. Prerequisite: Ger. 250 or the equivalent.

261. GERMAN ABROAD. 0 TO 15 HOURS. May be repeated for credit for a maximum of 45 hours. Lectures, seminars, and practical work in German language, literature, civilization, and teaching methods, taken in Austria. Prerequisites: Ger. 201 and 202 or the equivalents, 3.750 overall grade-point average, and 4.000 average in German.

270. EDUCATIONAL PRACTICE WITH SEMINAR I. 8 HOURS. Same as Education 270. The first half of a practice teaching two-segment sequence, including seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Ed. 250, admission to advanced standing, and recommendation of the department of specialization.

271. EDUCATIONAL PRACTICE WITH SEMINAR II. 8 HOURS. Same as Education 271. The second half of a practice teaching two-segment sequence, including seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Ed. 250, credit or concurrent registration in Ger. 270, admission to or continuation of advanced standing, and recommendation of the department of specialization.

290. MASTERWORKS OF GERMAN LITERATURE I. 4 HOURS. The classical period. Prerequisite: Ger. 221 or the equivalent.

292. MASTERWORKS OF GERMAN LITERATURE II. 4 HOURS. Romanticism and poetic realism. Prerequisite: Ger. 221 or the equivalent.

294. MASTERWORKS OF GERMAN LITERATURE III. 4 HOURS. From naturalism to the present. Prerequisite: Ger. 221 or the equivalent.

298. HONORS ESSAY. 4 HOURS. Restricted to German majors in their last year of work toward completion of the major. May not be taken in the last quarter in which the student expects to graduate. Prerequisites: Ger. 290, 292, 294 or the equivalents and at least a 4.6 average in all upper-division German courses previously taken.

299. INDEPENDENT STUDY. 1 TO 3 HOURS. May be repeated for credit. Open only to German majors and minors who are working on special projects. Prerequisites: Ger. 106 or the equivalent and approval of the department.

320. WRITING AND SPEAKING GERMAN V. 4 HOURS. Prerequisite: Ger. 204 or the equivalent.

321. WRITING AND SPEAKING GERMAN VI. 4 HOURS. Prerequisite: Ger. 320 or the equivalent.

370. THE GERMAN *NOVELLE.* 4 HOURS. Reading and interpretation of representative *Novellen* of the nineteenth and twentieth centuries. Prerequisites: Ger. 221 and two additional German literature courses or consent of the instructor.

372. GERMAN DRAMA. 4 HOURS. Development from the Enlightenment to the present. Prerequisites: Ger. 221, and two additional German literature courses or consent of the instructor.

374. POETRY FROM THE SEVENTEENTH CENTURY TO THE PRESENT. 4 HOURS. Prerequisite: Ger. 221 and two additional German literature courses or consent of the instructor.

380. GOETHE'S *FAUST.* 4 HOURS. Intensive study of Parts I and II. Prerequisites: Ger. 221 and two additional German literature courses or consent of the instructor.

382. GERMAN LITERATURE TO 1750. 4 HOURS. Prerequisites: Ger. 221 and two additional German literature courses or consent of the instructor.

385. GERMANIC LINGUISTICS. 4 HOURS. Linguistic geography, *Sprachschichten* and principles of structural linguistics. Prerequisite: Ger. 203 or the equivalent.

390. TOPICS IN GERMAN LITERATURE. 4 HOURS. May be taken more than once for credit. Reading and discussion of the work of one prominent German author or of a group of related authors. Subject varies and is chosen by the instructor. Prerequisites: Ger. 290, 292, 294, or consent of the instructor.

GREEK (Gr)

100. CLASSICAL GREEK. 4 HOURS. Not open to majors in Greek. Intensive introductory course. Rapid introduction to the language of Homer and Plato. Designed for students who wish sufficient training to begin reading on their own.

101. ELEMENTARY GREEK I. 4 HOURS. The fundamentals of ancient classical Greek, including the reading of simple prose. Eligibility will be tested during the first meeting.

102. ELEMENTARY GREEK II. 4 HOURS. Continues Greek 101. Grammar and reading. Prerequisite: Gr. 101 or the equivalent.

103. ELEMENTARY GREEK III. 4 HOURS. Continues Greek 102. Prerequisite: Gr. 102 or the equivalent.

104. INTERMEDIATE GREEK I. 4 HOURS. Introduction to epic poetry. Selections from Homer. Prerequisite: Gr. 103 or the equivalent.

105. INTERMEDIATE GREEK II. 4 HOURS. Introduction to dramatic poetry. Prerequisite: Gr. 104 or the equivalent.

106. INTERMEDIATE GREEK III. 4 HOURS. Introduction to philosophic prose: Study of Plato's *Socratic Dialogues.* Prerequisite: Gr. 105 or the equivalent.

201. XENOPHON: *HELLENICA*, BOOKS I and II. 4 HOURS. Reading and translation. Prerequisite: Gr. 106 or the equivalent.

202. PLATO: *SOCRATIC DIALOGUES.* 4 HOURS. Reading and translation of at least two of the following: *Apology, Crito, Charmides, Laches, Euthyphro, Hippias Minor, Ion.* Prerequisite: Gr. 106 or the equivalent.

203. ATTIC ORATORS. 4 HOURS. Reading and translation of selected orations by one or more of the Attic orators. Prerequisite: Gr. 106 or the equivalent.

205. HOMER: *ODYSSEY.* 4 HOURS. Reading and translation of selections. Prerequisite: Gr. 106 or the equivalent.

210. GREEK LYRIC POETRY. 4 HOURS. Reading and translation of selections from the lyric poets. Prerequisite: Gr. 106 or the equivalent.

211. PROSE COMPOSITION. 4 HOURS. Extensive practice in translation from English to Greek; review of grammar and forms. Prerequisite: Gr. 106 or the equivalent.

215. AESCHYLUS: TRAGEDIES. 4 HOURS. Reading and translation of one or more of the tragedies of Aeschylus. Prerequisite: Gr. 106.

220. SOPHOCLES: TRAGEDIES. 4 HOURS. Reading and translation of one or more of the tragedies of Sophocles. Prerequisite: Gr. 106 or the equivalent.

225. EURIPIDES: TRAGEDIES. 4 HOURS. Reading and translation of one or more of the tragedies of Euripides. Prerequisite: Gr. 106 or the equivalent.

275. HERODOTUS: HISTORIES. 4 HOURS. Reading and translation of portions of several of the books. Prerequisite: Gr. 106.

281. COMPARATIVE GRAMMAR OF GREEK AND LATIN. 4 HOURS. Same as Latin 281. Required of all students planning to do graduate work in classics. Comparative study of the sounds, inflections, word formation, and syntax of Greek and Latin. Prerequisites: Gr. 103 and Lat. 103 or the equivalents.

299. INDEPENDENT READING. 4 HOURS. Individual study under faculty direction. For students qualified by preparation and interest. Prerequisite: Gr. 201 or the equivalent.

305. HOMER: *ILIAD.* 4 HOURS. Reading and translation of extensive selections from the poem. Introduction to Homeric scholarship. Prerequisite: 8 hours of classical Greek at the 200 level or the equivalent.

310. PINDAR. 4 HOURS. Reading and analysis of selected *Odes.* Prerequisite: 8 hours of classical Greek at the 200 level or the equivalent.

315. AESCHYLUS: *AGAMEMNON.* 4 HOURS. Reading and analysis of the play; discussion of the use of myth. Prerequisite: 8 hours of classical Greek at the 200 level or the equivalent.

330. ARISTOPHANES. 4 HOURS. Reading and translation of at least two plays. Prerequisite: 8 hours of classical Greek at the 200 level or the equivalent.

340. DEMOSTHENES. 4 HOURS. Reading and analysis of two or more speeches; study of their historical background. Prerequisite: 8 hours of classical Greek at the 200 level or the equivalent.

350. PLUTARCH. 4 HOURS. Reading and interpretation of one or more of the *Moral Essays* or *Lives.* Prerequisite: 8 hours of classical Greek at the 200 level or the equivalent.

360. PLATO: *THE REPUBLIC.* 4 HOURS. Reading and interpretation of selections, analysis of style, thought, and of the development of some of the major arguments. Prerequisite: 8 hours of classical Greek at the 200 level or the equivalent.

365. ARISTOTLE: *NICOMACHEAN ETHICS.* 4 HOURS. Reading and analysis of selections from several books. Sources and problems of Aristotle's ethical writings. Prerequisite: 8 hours of classical Greek at the 200 level or the equivalent.

370. THUCYDIDES. 4 HOURS. Reading and translation of selections from Thucydides' *History of the Peloponnesian War.* Sources and problems of Greek historiography. Prerequisite: 8 hours of classical Greek at the 200 level or the equivalent.

380. HELLENISTIC POETRY. 4 HOURS. Reading and analysis of selections from 350 B.C. to 350 A.D. Prerequisite 8 hours of classical Greek at the 200 level or the equivalent.

381. GREEK LITERARY CRITICISM. 4 HOURS. Reading and translation of Aristotle's *Poetics* and selections from Longinus' *On the Sublime.* Prerequisite: 8 hours of classical Greek at the 200 level or the equivalent.

382. GREEK RHETORIC. 4 HOURS. Selected texts illustrative of the Greek contribution to the art of rhetoric; special attention to the *Rhetoric* of Aristotle. Prerequisite: 8 hours of classical Greek at the 200 level or the equivalent.

399. INDEPENDENT READING. 1 TO 4 HOURS. May be repeated for credit. For Greek majors and graduate students. Independent study under faculty direction. Prerequisite: 8 hours of classical Greek at the 200 level or the equivalent.

HEALTH SCIENCE (HSci)

240. MENTAL HEALTH IN THE MODERN URBAN COMMUNITY. 3 HOURS. Definition of urban problems and their impact upon the mental health of the individual, the family, and the community. Focus is on the young adult moving from the role of child in the family to adult developing his or her own family. Goals, values, processes, and problems are evaluated by the class as a group. Prerequisite: Sophomore standing.

HEBRAIC STUDIES (Heb)

101. ELEMENTARY HEBREW I. 4 HOURS. For students who have not studied Hebrew. Grammar, pronunciation, reading, composition, and conversation.

102. ELEMENTARY HEBREW II. 4 HOURS. Continues Hebrew 101. Prerequisite: Heb. 101 or the equivalent.

103. ELEMENTARY HEBREW III. 4 HOURS. Continues Hebrew 102. Prerequisite: Heb. 102.

104. INTERMEDIATE HEBREW I. 4 HOURS. Rapid reading of modern authors and Israeli newspapers. Syntax and composition; conversational practice. Prerequisite: Heb. 103 or the equivalent.

105. INTERMEDIATE HEBREW II. 4 HOURS. Continues Hebrew 104. Prerequisite: Heb. 104 or the equivalent.

106. INTERMEDIATE HEBREW III. 4 HOURS. Continues Hebrew 105. Prerequisite: Heb. 105 or the equivalent.

201. ADVANCED HEBREW I. 4 HOURS. Hebrew grammar, composition, and spoken idiom. Reading of selections from contemporary Hebrew literature and Israeli newspapers with emphasis on linguistic analysis. Written and oral presentations. Prerequisite: Heb. 106 or the equivalent.

202. ADVANCED HEBREW II. 4 HOURS. Hebrew grammar, composition, and spoken idiom. Reading of selections from contemporary Hebrew literature and Israeli

newspapers with emphasis on linguistic analysis. Written and oral presentations. Prerequisite: Heb. 201 or the equivalent.

203. ADVANCED HEBREW III. 4 HOURS. Hebrew grammar, composition, and spoken idiom. Reading of selections from contemporary Hebrew literature and Israeli newspapers with emphasis on linguistic analysis. Written and oral presentations. Prerequisite: Heb. 202 or the equivalent.

204. HEBREW LITERATURE AND COMPOSITION I. 3 HOURS. Orientation in varieties of language, the study of grammatical forms and idioms in Hebrew prose and poetry. Selections from modern Hebrew literature with emphasis on linguistic analysis. Prerequisite: Heb. 203 or the equivalent.

205. HEBREW LITERATURE AND COMPOSITION II. 3 HOURS. Continues Hebrew 204. Prerequisite: Heb. 106 or the equivalent.

206. HEBREW LITERATURE AND COMPOSITION III. 3 HOURS. Continues Hebrew 205. Prerequisite: Heb. 106 or the equivalent.

207. MODERN HEBREW LITERATURE. 3 HOURS. May be repeated for credit. From the beginning of the twentieth century to 1940.

208. MODERN HEBREW PROSE. 3 HOURS. May be repeated for a total of 6 hours of credit. Short works on various subjects and in various styles. Social and cultural backgrounds of the authors.

209. MEDIEVAL HEBREW POETRY. 3 HOURS. Hebrew poetry of medieval Spain. Emphasis on the works of Samuel Ha-Nagid, Solomon Ibn Gabirol, Judah Halevi, and Moses Ibn Ezra. The historical, social, and religious conditions of Jewish life in Muslim and Christian Spain as reflected in their poetry. Prerequisite: Heb. 106 or the equivalent.

210. MODERN HEBREW POETRY. 3 HOURS. May be repeated for a total of 6 hours of credit. The poetry of Bialik, Tchernichovsky, Shneur, Steinberg, Alterman, and Shlonsky. Readings and comparative analysis of their poetics. Prerequisite: Heb. 106 or the equivalent.

211. THE HEBREW ESSAY. 3 HOURS. Major trends in Jewish, religious, and national thought in modern times. Prerequisite: Heb. 106 or the equivalent.

212. THE WORKS OF AGNON. 3 HOURS. The biographical background and the style and narrative art of S. Y. Agnon; his outlook on the basis of Jewish problems of modern life in the Diaspora and in Israel. Prerequisite: Heb. 106 or the equivalent.

213. FORERUNNERS OF ISRAELI PROSE. 3 HOURS. Readings from Shofman, Smilansky, Agnon, and Berkovitz. Life in the early decades of the twentieth century in Eretz Israel reflecting the cultural life and problems of a pioneer society. Prerequisite: Heb. 106 or the equivalent.

214. THE LITERATURE OF THE HASKALAH MOVEMENT. 3 HOURS. Survey of the Enlightenment literature; emphasis on the works of Michal, Mapu, and Y. L. Gordon. Prerequisite: Heb. 106 or the equivalent.

215. CONTEMPORARY LITERATURE OF ISRAEL. 3 HOURS. Major literary and thematic trends in the poetry and prose of young Israeli writers. Poets: Alterman,

Ratosh, Amichay, Gilboa, and Rapikovitz. Authors: Yizhar, Shamir, Yehoshua and Apelfeld, and Shachar. Prerequisite: Heb. 106 or the equivalent.

216. THE DRAMA IN MODERN HEBREW LITERATURE. 3 HOURS. A survey.

HISTORY (Hist)

101. INTRODUCTION TO ANCIENT HISTORY. 4 HOURS. Introduction to history and historical methods through the study of ancient Near Eastern, Greek, and Roman history. Particular attention to the use of primary sources in reconstructing the past.

111. INTRODUCTION TO WESTERN EUROPEAN HISTORY. 4 HOURS. Introduction to history and historical methods through the study of aspects of Western European history from the Middle Ages to the present. Particular attention to the use of primary sources in reconstructing the past.

121. INTRODUCTION TO BRITISH HISTORY. 4 HOURS. Survey of certain aspects of British civilization in their historical setting.

131. INTRODUCTION TO EASTERN EUROPEAN HISTORY. 4 HOURS. Introduction to history and historical methods through the study of Russian, Balkan, and East Central European history. Particular attention to the use of primary sources in reconstructing the past.

141. INTRODUCTION TO AFRICAN HISTORY. 4 HOURS. Introduction to history and historical methods through the study of African history. Particular attention to the use of primary sources in reconstructing the past.

151. INTRODUCTION TO AMERICAN HISTORY. 4 HOURS. Introduction to history and historical methods through the study of American history. Particular attention to the use of primary sources in reconstructing the past.

161. INTRODUCTION TO LATIN-AMERICAN HISTORY. 4 HOURS. Same as Latin American Studies 161. Survey of certain aspects of Latin-American civilization in their historical setting.

171. INTRODUCTION TO ASIAN HISTORY. 4 HOURS. Introduction to history and historical methods through the study of Asian history. Particular attention to the use of primary sources in reconstructing the past.

Note: 200-level and 300-level courses are restricted to juniors, seniors, and those lower-division students who have the consent of the instructor.

201. THE ANCIENT WORLD: PREHISTORY AND THE ANCIENT NEAR EAST. 4 HOURS. The evolution of civilization. Ancient civilization prior to the Greeks. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

202. THE ANCIENT WORLD: GREECE TO THE AGE OF ALEXANDER. 4 HOURS. Same as Classics 202. Development of Greek civilization from the Helladic to Hellenistic periods. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

203. THE ANCIENT WORLD: ROME. 4 HOURS. Same as Classics 203. Development of Roman civilization from the eighth century B.C. to the fall of the Roman

Empire. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

205. MONUMENTS AND INSTITUTIONS OF ATHENS. 4 HOURS. Same as Classics 280. The monuments of Athens as they relate to the political and social institutions of the fifth century B.C. Prerequisite: Junior or senior standing.

206. THE MIDDLE AGES FROM 400 TO 814. 4 HOURS. Europe from the time of the barbarian invasion to the death of Charlemagne. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

207. THE MIDDLE AGES FROM 814 TO 1250. 4 HOURS. Europe to the death of Frederick II. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

208. THE MIDDLE AGES FROM 1250 TO 1500. 4 HOURS. Europe from the rise of the towns to the establishment of national monarchy. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

211. EUROPE: 1500 TO 1618. 4 HOURS. From the Renaissance to the outbreak of the Thirty Years' War. Prerequisite: 4 hours of history at the 100 level or junior standing or consent of the instructor.

212. EUROPE: 1618 TO 1713. 4 HOURS. From the Thirty Years' War to the Peace of Utrecht. Prerequisite: 4 hours of history at the 100 level or junior standing or consent of the instructor.

213. EUROPE: 1713 TO 1815. 4 HOURS. From the Peace of Utrecht to the Congress of Vienna. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

214. EUROPE: 1815 TO 1870. 4 HOURS. From the Congress of Vienna to the Franco-Prussian War. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

215. EUROPE: 1870 TO 1919. 4 HOURS. From the Franco-Prussian War to World War I. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

216. EUROPE: 1919 TO THE PRESENT. 4 HOURS. Europe since World War I. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

218. GERMAN HISTORY FROM 1618 TO 1740. 4 HOURS. The Thirty Years' War: its political, economic, and social effects on German public life. The rise of absolutism, the decline of the *Reich,* economic reconstruction and cameralism, the changing structure of social relationships. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

219. GERMAN HISTORY FROM 1740 TO 1848. 4 HOURS. The rise of Prussia and Austro-Prussian dualism; enlightened absolutism in Germany; Germany in the revolutionary period; the rise of political ideologies and middle-class culture; the revolutions of 1848. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

220. MODERN GERMANY FROM 1848 TO THE PRESENT. 4 HOURS. Germany's political, economic, and social reaction to the problems of national unification, industrialism, liberalism, world-power status, and rejuvenation after the loss of that status in World War I and World War II. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

221. HISTORY OF ENGLAND TO 1485. 4 HOURS. Survey from the Celtic immigration to the accession of Henry VII. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

222. HISTORY OF ENGLAND FROM 1485 TO 1714. 4 HOURS. England during the reigns of the Tudors and the Stuarts. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

223. HISTORY OF ENGLAND FROM 1714 TO THE PRESENT. 4 HOURS. From the accession of the Hanoverians to the present. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

224. HISTORY OF FRANCE FROM 1715 TO 1815. 4 HOURS. The origin of the French Revolution, the revolution itself, and its spread throughout Europe. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

225. DEVELOPMENT OF MODERN FRANCE FROM 1815 TO 1914. 4 HOURS. Investigation into the major political and socioeconomic forces at work in French history from the fall of Napoleon to World War I. The uniqueness and the universality of the French experience are stressed. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

226. DEVELOPMENT OF MODERN FRANCE FROM 1914 TO THE PRESENT. 4 HOURS. Investigation into the major political and socioeconomic forces at work in French history from World War I to Charles de Gaulle's Fifth Republic. The uniqueness and the universality of the French experience are stressed. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

229. ITALIAN HISTORY FROM 1815 TO 1870. 4 HOURS. The impact of the French Revolution, the *Risorgimento,* the creation of the Italian nation-state, and the early years of the Kingdom of Italy. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

230. ITALIAN HISTORY FROM 1870 TO THE PRESENT. 4 HOURS. Development of the Italian national state: political, social, and economic problems before World War I, the church-state relationship, colonial ambitions, the fascist corporate state, the Italian Republic since World War II. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

231. HISTORY OF THE BYZANTINE CIVILIZATION FROM 330 TO 1054. 4 HOURS. The cultural, religious, and social history of the Eastern Roman Empire from the founding of Constantinople to 1054. Special attention to the continuation of classic ideals and Byzantine relations with the Latin West and the Slavic, especially the Russian, worlds. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

232. HISTORY OF THE BYZANTINE CIVILIZATION FROM 1054 TO 1453. 4 HOURS. The cultural, religious, and social history of the Eastern Roman Empire from 1054 to the fall of Byzantium. Special attention to the continuation of classic ideals and Byzantine relations with the Latin West and the Slavic, especially the Russian, worlds. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

233. HISTORY OF EAST-CENTRAL EUROPE SINCE 1526. 4 HOURS. The political, social, economic, and cultural development of Austria, Hungary, Poland, and the Czechoslovak lands from the Battle of Mohacs to the present. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

235. RUSSIA FROM THE EARLIEST TIMES TO PETER THE GREAT. 4 HOURS. The Russian people, state, and culture from their origins to the death of Peter the Great in 1725. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

236. IMPERIAL RUSSIA. 4 HOURS. Political, diplomatic, intellectual, and social developments in the Russian Empire from the death of Peter the Great to the Revolution of 1905. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

237. THE RUSSIAN REVOLUTION AND THE SOVIET UNION. 4 HOURS. Russian and Soviet political, diplomatic, ideological, economic, social, and cultural developments during the Duma period, World War I, the Russian Revolution and war, communism, the NEP, and the Five Year Plan. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

241. AFRICAN HISTORY TO 1640. 4 HOURS. Development of human civilization; the rise of kingdoms and territorial states; migrations of peoples; the spread and impact of Islam; the imposition of Portuguese and Omani empires. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

243. AFRICAN HISTORY: 1640 TO 1881. 4 HOURS. The nature of European influence in Africa; trading networks, the rise of kingdoms in the West African forest, the south-central savanna, and the south-eastern coast; jihad movements; the development of indigenous African empires. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

245. AFRICAN HISTORY: 1881 TO THE PRESENT. 4 HOURS. The effect of European partition and colonialism on African peoples; African military and political resistance movements; the rise of nationalism; the problems of independence. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

251. HISTORY OF THE UNITED STATES TO 1816. 4 HOURS. From colony to nationhood: European foundations, colonial development, independence, and early nationhood. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

252. HISTORY OF THE UNITED STATES FROM 1816 TO 1898. 4 HOURS. America in the nineteenth century: Jacksonian democracy, changing issues and parties, sectionalism, the Civil War and Reconstruction, the consequences of the industrial revolution. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

253. HISTORY OF THE UNITED STATES SINCE 1898. 4 HOURS. The emergence of the United States as a world power. World Wars I and II, problems of economic and social change in modern times, the cold war. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

256. THE HISTORY OF CHICAGO. 4 HOURS. Evolution of Chicago from frontier outpost to modern metropolis; economic, social, political, and cultural changes and institutions. Prerequisite: 4 hours of history or consent of the instructor.

257. AFRO-AMERICAN HISTORY OF THE SEVENTEENTH CENTURY. 4 HOURS. Same as Black Studies 257. West African origins of the American black population, the slave trade and seventeenth century slavery. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

258. AFRO-AMERICAN HISTORY FROM THE EIGHTEENTH CENTURY TO THE CIVIL WAR. 4 HOURS. Same as Black Studies 258. Afro-American slavery, black religion, black leadership, the black role in antislavery movements, the plantation and its way of life. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

259. AFRO-AMERICAN HISTORY SINCE THE CIVIL WAR. 4 HOURS. Same as Black Studies 259. The Reconstruction, black institutions and organizations, black labor, varieties of civil rights approaches and leaders thereof. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

261. COLONIAL LATIN AMERICA. 4 HOURS. Same as Latin American Studies 261. Iberian discovery, conquest, and settlement of America; the establishment of Spanish and Portuguese institutions; social, economic, political, and cultural development in colonial societies from conquest to independence. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

262. LATIN AMERICA IN THE NINETEENTH CENTURY. 4 HOURS. Same as Latin American Studies 262. The independence of Latin America and the establishment of the new nations. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

263. MODERN LATIN AMERICA. 4 HOURS. Same as Latin American Studies 263. The Latin American nations in the twentieth century; their social, economic, political, and cultural development and their struggles for modernization. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

264. COLONIAL MEXICO. 4 HOURS. Same as Latin American Studies 264. The Indian background of Mexico, the Spanish conquest, the amalgamation of Spanish and indigenous cultures, and the evolution of Mexican economic, religious, social, and political institutions under Spanish domination until 1821. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

265. THE MEXICAN NATION FROM 1821 TO 1910. 4 HOURS. Same as Latin American Studies 265. Social, economic, political, and cultural development from independence to the fall of Porfirio Diaz. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

266. MEXICO SINCE 1910. 4 HOURS. Same as Latin American Studies 266. The Mexican Revolution and the development of the modern nation. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

267. THE ESTABLISHMENT OF THE BRAZILIAN NATION: 1500 TO 1850. 4 HOURS. Same as Latin American Studies 267. Portuguese discovery, settlement, and exploitation of Brazil during three centuries; creation of the Brazilian nation through an amalgamation of races and cultures in a plantation and mining economy; the establishment and consolidation of independence. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

268. MODERN BRAZIL FROM 1850 TO THE PRESENT. 4 HOURS. Same as Latin American Studies 268. The empire of Pedro II, the antislavery struggle, the Conservative republic, the Vargas era, social and cultural development, and the struggle for democracy and modernization. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

271. HISTORY OF CHINA AND JAPAN I. 4 HOURS. Topical survey of premodern China from earliest times to 1800 A.D.: political philosophy, administrative systems, religion, social life. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

272. HISTORY OF CHINA AND JAPAN II. 4 HOURS. Continues History 271. Premodern Japan from earliest times to 1868 A.D.: political institutions, ideology, religion, cultural life. Prerequisite: Hist. 271.

273. HISTORY OF CHINA AND JAPAN III. 4 HOURS. Continues History 272. Nineteenth and twentieth century modern China and Japan: response to the West, modernization, intellectual, social, and political developments. Prerequisite: Hist. 272.

278. THE PHILIPPINE ISLANDS: 1565 TO 1946. 4 HOURS. A historical study of intercultural contact in a colonial setting; the development of the Philippine nation from diverse social, cultural, and institutional sources, indigenous and alien. Prerequisite: 4 hours of history at the 100 level or junior standing or consent of the instructor.

286. HISTORY OF MINORITIES IN THE UNITED STATES: COLONIAL PERIOD THROUGH RECONSTRUCTION. 4 HOURS. Same as Black Studies 286. Racial, ethnic, religious, and political minorities in the United States. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

287. HISTORY OF MINORITIES IN THE UNITED STATES: RECONSTRUCTION TO THE PRESENT. 4 HOURS. Same as Black Studies 287. Racial, ethnic, religious, and political minorities in the United States. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

294. HISTORY OF EDUCATION IN WESTERN CIVILIZATION. 4 HOURS. History of education from antiquity to the present in relation to social, political, and religious influences; development of education and educational institutions in the context of factors in European history which affected conceptions of learning and teaching; tensions between different ideals of learning and their influence on schools and curricula. Prerequisite: 4 hours of history at the 100 level or junior standing or consent of the instructor.

295. THE TEACHING OF HISTORY AND RELATED DISCIPLINES. 4 HOURS. Introduction to source material and historical literature relevant to the teaching of history and related disciplines in the secondary school; exploration of basic concepts and major themes of historical interpretation. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

296. HISTORY OF SCIENCE. 4 HOURS. Development of science from its Greek origins to the present in terms of central ideas, such as atomism, evolution, and the relevance of mathematics to physics. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

297. HISTORY OF TECHNOLOGY. 4 HOURS. The development of technology. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

299. INDIVIDUAL STUDY: SPECIAL TOPICS. 2 TO 5 HOURS. May be taken only once for 2 to 5 hours of general education credit, but may be repeated for credit for a maximum of 18 hours. However, without the specific approval of the department, no more than 5 hours in the same quarter may be taken under the direction of the same instructor, and no more than a total of 12 hours may be taken in the same quarter. Selected topics in history for individual study. Prerequisite: Consent of the instructor.

302. TOPICS IN GREEK HISTORY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of ancient history or consent of the instructor.

303. TOPICS IN ROMAN HISTORY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of ancient history or consent of the instructor.

306. TOPICS IN MEDIEVAL HISTORY. 4 HOURS. May be repeated for credit. Same as Religious Studies 306. Specific topics are announced each quarter. Prerequisite: 4 hours of medieval history or consent of the instructor.

309. TOPICS IN THE RENAISSANCE. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.

311. TOPICS IN SIXTEENTH CENTURY EUROPEAN HISTORY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.

312. TOPICS IN SEVENTEENTH CENTURY EUROPEAN HISTORY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.

313. TOPICS IN EIGHTEENTH CENTURY EUROPEAN HISTORY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.

314. TOPICS IN NINETEENTH CENTURY EUROPEAN HISTORY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.

316. TOPICS IN TWENTIETH CENTURY EUROPEAN HISTORY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.

318. TOPICS IN GERMAN HISTORY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.

321. TOPICS IN BRITISH HISTORY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.

324. TOPICS IN FRENCH HISTORY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.

329. TOPICS IN ITALIAN HISTORY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.

333. TOPICS IN EASTERN EUROPEAN HISTORY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.

335. TOPICS IN RUSSIAN HISTORY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of European history or consent of the instructor.

341. TOPICS IN AFRICAN HISTORY. 4 HOURS. Study in depth of specific problems of internal African history, with concentration on such topics as the African role in the slave trade, the growth and decline of African states, African syntheses with European culture, or the African reaction to European domination and conquest. Prerequisite: 4 hours of African history.

351. TOPICS IN COLONIAL AMERICAN HISTORY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of United States history or consent of the instructor.

352. TOPICS IN REVOLUTIONARY AND EARLY NATIONAL UNITED STATES HISTORY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of United States history or consent of the instructor.

353. TOPICS IN NINETEENTH CENTURY UNITED STATES HISTORY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of United States history or consent of the instructor.

354. TOPICS IN TWENTIETH CENTURY UNITED STATES HISTORY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of United States history or consent of the instructor.

361. TOPICS IN LATIN AMERICAN HISTORY. 4 HOURS. May be repeated for credit. Same as Latin American Studies 361. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.

386. TOPICS IN RACE, ETHNIC, AND MINORITY HISTORY. 4 HOURS. May be repeated for credit. Same as Black Studies 386. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.

388. TOPICS IN ECONOMIC HISTORY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of economic history or consent of the instructor.

389. TOPICS IN URBAN HISTORY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.

390. TOPICS IN DIPLOMATIC HISTORY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.

391. TOPICS IN CONSTITUTIONAL HISTORY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.

392. TOPICS IN INTELLECTUAL HISTORY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.

393. TOPICS IN HISTORIOGRAPHY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.

394. TOPICS IN FOLKLORE-HISTORY RELATIONS. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.

395. TOPICS IN RELIGIOUS HISTORY. 4 HOURS. May be repeated for credit. Same as Religious Studies 395. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.

396. TOPICS IN THE HISTORY OF SCIENCE. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.

397. TOPICS IN THE HISTORY OF TECHNOLOGY. 4 HOURS. May be repeated for credit. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.

HISTORY OF ARCHITECTURE AND ART (HAA)

115. INTRODUCTION TO ART HISTORY. 4 HOURS. Introduction to the hypotheses of art. Visual and stylistic analysis, study of iconology, sociology of art, economics of art, criticism, the artist's role in history.

142. HISTORY OF ARCHITECTURE AND ART I. 4 HOURS. Form and meaning in architecture, sculpture, painting, and the allied arts from antiquity through the Middle Ages.

143. HISTORY OF ARCHITECTURE AND ART II. 4 HOURS. Form and meaning in architecture, sculpture, painting, and the allied arts from the early Renaissance through the late Baroque period. Prerequisite: HAA 115 or 142.

144. HISTORY OF ARCHITECTURE AND ART III. 4 HOURS. Form and meaning in architecture, sculpture, painting, and the allied arts from neoclassicism into the present. Prerequisite: HAA 115 or 143.

201. PREHISTORIC ART. 4 HOURS. The art and artifacts of the Paleolithic and Neolithic peoples of Europe and Asia. Prerequisite HAA 115 or 142 or consent of the instructor.

202. PRIMITIVE ART. 4 HOURS. Survey of the arts of the primitive people of Africa, Oceania, and the Americas. Prerequisite: HAA 115 or 144, or consent of the instructor.

211. ART AND ARCHAEOLOGY OF THE ANCIENT NEAR EAST. 4 HOURS. The development of painting, sculpture, and allied arts in Egypt, western Asia, and the Aegean from the beginning of the Bronze Age to the end of the second millenium B.C. Prerequisite: HAA 115 or 142 or consent of the instructor.

212. GREEK ART AND ARCHAEOLOGY. 4 HOURS. The development of painting, sculpture, and the allied arts of Greece from the end of the Bronze Age through the Hellenistic period. Prerequisite: HAA 115 or 142 or consent of the instructor.

213. ROMAN ART AND ARCHAEOLOGY. 4 HOURS. Painting, sculpture, and the allied arts of ancient Italy; special emphasis on the development of Roman civilization. Prerequisite: HAA 115 or consent of the instructor.

221. EARLY CHRISTIAN AND BYZANTINE ART. 4 HOURS. The art and architecture of the Latin West and the Greek East from the Age of Constantine through the First Golden Age of Byzantine art under Justinian. Prerequisite: HAA 115 or 142 or consent of the instructor.

222. EARLY MEDIEVAL ART. 4 HOURS. The art and architecture of western Europe from the Dark Ages through the early Romanesque; special attention to the Carolingian and Ottonian revivals of antiquity. Prerequisite: HAA 115 or 142 or consent of the instructor.

223. MEDIEVAL ART, 1100 TO 1400. 4 HOURS. Art and architecture of the mature Romanesque through the High Gothic age. Prerequisite: HAA 115 or 142 or consent of the instructor.

231. ANCIENT ARCHITECTURE. 4 HOURS. The development of the architecture of the ancient Near East, Greece, and Rome. Prerequisite: HAA 115 or 142 or consent of the instructor.

232. MEDIEVAL ARCHITECTURE. 4 HOURS. The development of early Christian, Byzantine, Romanesque, and Gothic architecture. Prerequisite: HAA 115 or 144 or consent of the instructor.

233. RENAISSANCE AND BAROQUE ARCHITECTURE. 4 HOURS. The development of European architecture from 1400 to 1750. Prerequisite: HAA 115 or 144 or consent of the instructor.

234. AMERICAN ARCHITECTURE. 4 HOURS. The development of architecture in colonial America and the United States from 1600 to 1900. Prerequisite: HAA 115 or 144 or consent of the instructor.

235. EUROPEAN ARCHITECTURE, 1750 TO 1900. 4 HOURS. Romantic Classicism and Gothic Revival in England, France, and Germany. Other revival styles and Art Nouveau. Building in iron and concrete. Prerequisite: HAA 115 or 144 or consent of the instructor.

236. TWENTIETH CENTURY ARCHITECTURE. 4 HOURS. The development of architecture in Europe and the United States from 1900 to the present. Prerequisite: HAA 115 or 144 or consent of the instructor.

237. JAPANESE ARCHITECTURE. 4 HOURS. Religious, domestic, and landscape architecture of Japan. Prerequisite: HAA 115 or 144 or consent of the instructor.

238. PRE-COLUMBIAN ARCHITECTURE. 4 HOURS. Architecture of North, Central, and South America before 1500. Prerequisite: HAA 115 or 144 or consent of the instructor.

241. ART OF THE RENAISSANCE IN ITALY. 4 HOURS. Painting, sculpture, and architecture of the fifteenth and sixteenth centuries. Prerequisite: HAA 115 or 143 or consent of the instructor.

242. ART OF THE RENAISSANCE IN NORTHERN EUROPE. 4 HOURS. The art of the Lowlands, France, Germany, and England; emphasis on illuminated manuscripts, panel painting, and the work of Van Eyck, Van der Weyden, Bosch, Lochner, Dürer, and the School of Fontainebleau. Prerequisite: HAA 115 or 143 or consent of the instructor.

251. ART OF THE BAROQUE. 4 HOURS. Painting, sculpture, and the allied arts from the seventeenth through the mid-eighteenth century; emphasis on the work of Bernini, Rubens, Rembrandt, and Velasquez. Prerequisite: HAA 115 or 144 or consent of the instructor.

261. ART OF THE NINETEENTH CENTURY. 4 HOURS. Painting, sculpture, and the allied arts in western Europe and the United States. Prerequisite: HAA 115 or 144 or consent of the instructor.

262. ART OF THE TWENTIETH CENTURY. 4 HOURS. Painting, sculpture, and the allied arts in western Europe and the United States. Prerequisite: HAA 115 or 144 or consent of the instructor.

271. ART OF CHINA. 4 HOURS. Survey of Chinese painting, sculpture, and related arts from Neolithic times to the eighteenth century. Prerequisite: HAA 115 or 144 or consent of the instructor.

272. ART OF JAPAN. 4 HOURS. Survey of Japanese architecture, sculpture, painting, woodcuts, and related arts from prehistoric times to the nineteenth century. Prerequisite: HAA 115 or 144 or consent of the instructor.

273. ART OF INDIA AND SOUTHEAST ASIA. 4 HOURS. Survey of architecture, sculpture, and painting from the Indus Valley civilization to the Mughal period. Prerequisite: HAA 115 or 144 or consent of the instructor.

280. HISTORY OF INDUSTRIAL DESIGN. 4 HOURS. Materials, techniques, and products from antiquity to the present; production methods; the role of the designer in industry and society. Prerequisite: 3 hours of HAA or consent of the instructor.

281. ART IN AMERICA TO 1860. 4 HOURS. Painting, sculpture, and the significant handicrafts from Colonial America through the mid-nineteenth century United States. Emphasis on portraiture, historical painting, and the romantic landscape. Prerequisite: HAA 115 or 144 or consent of the instructor.

282. ART IN AMERICA FROM 1860 TO 1945. 4 HOURS. Painting, sculpture, and the decorative arts from the mid-nineteenth century through World War II. The emergence of an American art consciousness and progress toward international leadership. Prerequisite: HAA 115 or 144 or consent of the instructor.

284. HISTORY OF PHOTOGRAPHY. 4 HOURS. Technological and artistic development. Prerequisite: Sophomore standing or consent of the instructor.

285. HISTORY OF THE FILM I. 4 HOURS. From the beginnings in the 1890's to the establishment of the talking picture in the early 1930's. Prerequisite: Sophomore standing or consent of the instructor.

286. HISTORY OF THE FILM II. 4 HOURS. From the establishment of sound and the genres of the 1930's to the present. Prerequisite: Sophomore standing or consent of the instructor.

288. THE INTELLECTUAL REVOLUTION OF THE SEVENTEENTH AND EIGHTEENTH CENTURIES AS VIEWED THROUGH THE ARTS. 4 HOURS. Same as Humanities 288 and Music 288. Evidence in the visual arts and music of the impact of the new cosmology on men's minds, imaginations, and emotions. Prerequisite: Sophomore standing.

291. ART HISTORY TUTORIAL. 4 HOURS. The methodology and philosophies of art history. Application to selected problems in the field. Readings, discussions, and reports. Prerequisites: Junior standing and 12 hours of history of architecture and art at the 200 and 300 level.

311. THE ANCIENT CITY. 4 HOURS. The historical development of the city in the ancient Near East, Greece, and the Roman Empire. Prerequisite: Graduate standing in architecture or 8 hours in the history of architecture and art ancient sequence or consent of the instructor.

323. GOTHIC SCULPTURE. 4 HOURS. Development of sculpture in northern Europe from 1140 to 1530. Prerequisites: Junior standing and 4 hours of history of architecture and art at the 200 level.

325. SEMINAR ON MEDIEVAL ART. 4 HOURS. Individual conferences on assigned papers are required. Selected problems in the history of medieval art. Series of lectures followed by student reports. Prerequisites: Junior standing and 4 hours in history of architecture and art courses at the 200 level or consent of the instructor.

331. SEMINAR IN ARCHITECTURAL HISTORY. 4 HOURS. Selected problems in the history of architecture. Prior to registration the student should be advised by the instructor. Prerequisite: 12 hours from HAA 231 through 238 or consent of the instructor.

332. READINGS IN HISTORY OF ARCHITECTURE. 4 HOURS. Individually planned readings on selected topics under the supervision of a faculty member. Prerequisites: 12 hours from HAA 231 through 238 and approval of the instructor and the department.

333. LITERATURE, THEORY, AND CRITICISM. 4 HOURS. Selected readings and discussion of significant writers on architecture. Prerequisites: 12 hours from HAA 231 through 238 and approval of the instructor and the department.

334. CHICAGO BUILDING. 4 HOURS. Architectural and technical history of Chicago's commerical buildings from 1871 to the present. Prerequisite: 12 hours from HAA 231 through 238.

335. WRIGHT AND HIS CONTEMPORARIES, 1890 TO 1910. 4 HOURS. Frank Lloyd Wright's domestic buildings in the Chicago area and his relationship to other members of the Prairie School of midwest architecture. Lectures, discussions, and field trips. Prerequisite: 12 hours from HAA 231 through 238.

336. SEMINAR: ADLER AND SULLIVAN. 4 HOURS. A critical study of Chicago's foremost architectural partnership: monuments, theories, and practice. Prerequisite: 12 hours from HAA 231 through 238 and HAA 334.

341. ART OF THE FIFTEENTH CENTURY IN FLORENCE. 4 HOURS. Stylistic and iconographic studies of works of the major painters, sculptors, and architects. Florentine history and literature are considered in their relation to the visual arts. Prerequisites: Junior standing and 4 hours in history of architecture and art courses at the 200 level.

342. ART OF THE HIGH RENAISSANCE. 4 HOURS. Art of the great Italian centers during the late fifteenth and early sixteenth centuries. Emphasis on Leonardo, Raphael, Bramante, Bellini, Giorgione, and Michelangelo. Prerequisites: Junior standing and 4 hours in history of architecture and art courses at the 200 level.

343. ITALIAN ART FROM 1520 TO 1600. 4 HOURS. Art of the sixteenth century; emphasis on painting and sculpture. Special attention is given to Corregio, Pontormo, Bronzino, Gianbologna, Michelangelo, Palladio, Titian, and Tintoretto. Prerequisites: Junior standing and 4 hours in history of architecture and art courses at the 200 level.

361. PROSEMINAR IN MODERN PAINTING. 4 HOURS. May be repeated for credit at the discretion of the department. Selected examples; development and diffusion of style and iconography. Analogies in the history of ideas and events, technical change, and other pertinent material. Prerequisites: Junior standing and 4 hours in history of architecture and art courses at the 200 level.

362. PROSEMINAR IN MODERN SCULPTURE. 4 HOURS. May be repeated for credit at the discretion of the department. Selected examples; development and diffusion of style and iconography. Analogies in the history of ideas and events, technical change, and other pertinent material. Prerequisites: Junior standing and 4 hours in history of architecture and art courses at the 200 level.

363. CONTEMPORARY ART. 4 HOURS. The most recent developments in contemporary art, its theories and production. Prerequisites: Junior standing and 4 hours in history of architecture and art courses at the 200 level.

371. CHINESE LANDSCAPE PAINTING. 4 HOURS. Chinese landscape painting from its origins to the twentieth century; major trends and figures. Prerequisite: HAA 271 or 12 hours of Asian studies or consent of the instructor.

372. JAPANESE PRINTS. 4 HOURS. History from the fourteenth century to the present; emphasis on Ukiyoe Hanga of the seventeenth to nineteenth centuries. Prerequisite: HAA 272 or the equivalent or consent of the instructor.

381. SEMINAR ON AMERICAN ART. 4 HOURS. Individual conferences on assigned papers are required. American artists or movements selected with the permission of the instructor. Prerequisites: Junior standing and 12 hours of history of architecture and art at the 200 level or consent of the instructor.

385. SEMINAR: FILM ISSUES. 4 HOURS. Individual conferences on assigned papers are required. Studies in genres, schools, individual artists, critics, and theorists of the motion picture. Subject areas are specified by the instructor. Prerequisites: Junior standing and HAA 285, 286 or consent of the instructor.

390. ART HISTORY TUTORIAL. 4 HOURS. Methodology and philosophies of art history; application to selected problems in the field. Readings, discussions, and reports concerning fundamental literature of art history. Prerequisites: Senior standing and 12 hours in history of architecture and art courses at the 200 and 300 levels or consent of the instructor.

391. SPECIAL STUDIES IN HISTORY OF ART. 4 HOURS. May be repeated for a maximum of 12 hours. Discussions of special problems, with attention to a major theme, period, or artist. Student reports are required. Prerequisites: Senior standing, 12 hours in history of architecture and art courses at the 200 and 300 levels, and approval of the instructor and the department.

392. READINGS IN ART HISTORY. 4 HOURS. May be repeated for credit at the discretion of the department. Individually planned readings on selected topics under the supervision of a faculty member. Prerequisites: Senior standing, 12 hours in history of architecture and art courses beyond the 100 level, and approval of the instructor and the department.

393. HISTORY OF COLLECTING AND MUSEOLOGY. 4 HOURS. Individual conferences on assigned papers are required. The history of collecting and patronage. The scope and operation of public and private collections and museums. Lectures, discussions, and field trips. Prerequisites: HAA 142, 143, 144, junior standing or consent of the instructor.

HUMANITIES (Hum)

101. INTRODUCTION TO POETRY. 4 HOURS. Same as English 101. Reading and discussion of representative poems from the ancient world to the present.

102. INTRODUCTION TO DRAMA. 4 HOURS. Same as English 102. Reading and discussion of representative plays from the ancient world to the present.

103. INTRODUCTION TO FICTION. 4 HOURS. Same as English 103. Reading and discussion of representative fiction from the beginnings to the present.

104. THE TRADITION OF WESTERN LITERATURE OF THE ANCIENT WORLD. 4 HOURS. Same as Classics 104. Primarily for non-English and nonlanguage majors. Selected masterpieces of poetry, drama, and fiction of the ancient world.

105. THE TRADITION OF WESTERN LITERATURE FROM THE MIDDLE AGES THROUGH THE SEVENTEENTH CENTURY. 4 HOURS. Primarily for non-English and nonlanguage majors. Selected masterpieces of poetry, drama, fiction, and prose.

106. THE TRADITION OF WESTERN LITERATURE FROM THE EIGHTEENTH CENTURY TO THE PRESENT. 4 HOURS. Primarily for non-English and non-language majors. Selected masterpieces of poetry, drama, fiction, and prose.

107. COLLOQUIUM ON WORLD LITERATURE AND RELATED FIELDS. 4 HOURS. May be repeated for a maximum of 12 hours. One specific aspect of literature and its relationship to a limited problem in such fields as the fine arts, philosophy, politics, psychology, religion, science, and sociology. Emphasis on the close study of a limited number of works and on independent study, including oral and written reports.

108. COLLOQUIUM ON THEMES IN WORLD LITERATURE. 4 HOURS. May be repeated for a maximum of 12 hours. One selected theme; emphasis on the close study of a limited number of works and on independent study, including oral and written reports.

131. DOSTOEVSKY. 4 HOURS. Discussion of selected short stories and novels by Fyodor Dostoevsky. Knowledge of Russian is not required.

132. TOLSTOY. 4 HOURS. Discussion of the writings of Leo Tolstoy. Knowledge of Russian is not required.

133. CHEKHOV. 4 HOURS. Discussion of selected short stories and plays by Anton Chekhov. Knowledge of Russian is not required.

134. GOGOL. 4 HOURS. Discussion of selected prose works and plays by Nikolai Gogol. Knowledge of Russian is not required.

135. SOLZHENITSYN. 4 HOURS. Discussion of selected short stories and novels by Alexander Solzhenitsyn. Knowledge of Russian is not required.

161. FRENCH CIVILIZATION I. 4 HOURS. Same as French 161. History of French civilization from the end of the Middle Ages to the end of the Wars of Religion, considered in the light of changes that were typical for all of Western Europe. The literature, religious thought, art, and sciences of this period are viewed against the background of political and social change.

170. MASTERPIECES OF LUSO-BRAZILIAN LITERATURE IN ENGLISH TRANSLATION. 4 HOURS. May be repeated for credit each quarter topics change. Same as Latin American Studies 170 and Portuguese 170. Representative works with background material.

171. READINGS IN LUSO-BRAZILIAN CULTURE IN ENGLISH TRANSLATION. 4 HOURS. Same as Latin American Studies 171 and Portuguese 171. Selected topics. May be repeated for credit each quarter topics change.

172. PORTUGUESE LITERATURE IN ENGLISH TRANSLATION. 4 HOURS. Same as Portuguese 172. Introduction to the Portuguese literary tradition. Reading and discussion of major literary movements, individual works, and such literary figures as Gil Vicente, Camões, Eça de Queiroz, and Fernando Pessoa. Prerequisites: Hum. 170 and 171 or consent of the instructor.

184. GREAT FRENCH WRITERS IN TRANSLATION. 4 HOURS. May be repeated for credit. Same as French 184. Not open to French majors or minors. Selections in English translation from the major works of France's greatest writers. Authors are announced each quarter.

185. MASTERPIECES OF GERMAN LITERATURE IN ENGLISH TRANSLATION. 4 HOURS. Same as German 185. Not open to German majors.

186. MASTERPIECES OF FRENCH LITERATURE IN ENGLISH TRANSLATION. 4 HOURS. Same as French 186. Not open to French majors or minors. Reading of selected works from the seventeenth century to the present.

187. MASTERPIECES OF SPANISH LITERATURE IN ENGLISH TRANSLATION. 4 HOURS. Same as Latin American Studies 187 and Spanish 187. Not open to Spanish majors.

190. FRANZ KAFKA. 4 HOURS. Same as German 190. Major novels and short stories in English translation.

191. BERTOLT BRECHT. 4 HOURS. Same as German 191. Major works in English translation.

192. HERMANN HESSE. 4 HOURS. Same as German 192. Major works in English translation.

195. GOETHE'S WORKS IN TRANSLATION. 4 HOURS. Same as German 195. *Faust* and other representative works in English translation.

196. MAJOR WORKS OF SCHILLER IN ENGLISH TRANSLATION. 4 HOURS. Same as German 196. Lectures and discussions on Schiller's dramas and aesthetic treatises.

201. ITALIAN LITERATURE IN ENGLISH TRANSLATION I. 4 HOURS. Same as Italian 201. Development from its origins to the fifteenth century. Lecture, reading, and discussion of major works. Prerequisite: Sophomore standing or consent of the instructor.

202. ITALIAN LITERATURE IN ENGLISH TRANSLATION II. 4 HOURS. Same as Italian 202. Development from the sixteenth to the eighteenth century. Lecture, reading, and discussion of major works. Prerequisite: Sophomore standing or consent of the instructor.

203. ITALIAN LITERATURE IN ENGLISH TRANSLATION III. 4 HOURS. Same as Italian 203. Development from the beginning of the nineteenth century to the present. Lecture, reading, and discussion of major works. Prerequisite: Sophomore standing or consent of the instructor.

221. INTRODUCTION TO POLISH LITERATURE I. 4 HOURS. Same as Polish 221. Major trends and authors from the Renaissance to Romanticism: Rey, Kochanowski, Potocki, Krasicki, and Boguslawski. Prerequisite: Junior standing or consent of the instructor.

222. INTRODUCTION TO POLISH LITERATURE II. 4 HOURS. Same as Polish 222. Major trends and authors of the nineteenth century: Mickiewicz, Slowacki, Krasinski, Norwid, Fredro, Orzeszkowa, Sienkiewicz, and Prus. Prerequisite: Junior standing or consent of the instructor.

223. INTRODUCTION TO POLISH LITERATURE III. 4 HOURS. Same as Polish 223. Major trends and authors of the twentieth century: Tetmajer, Kasprowicz, Staff, Lésmian, Wyspiański, Zeromski, Berent, Reymont, Brzozowski, Matuszewski, Tuwim, Slonimski, Wierzyński, Pawlikowska, Irzykowski, and Boy-Zeleński. Prerequisite: Junior standing or consent of the instructor.

231. INTRODUCTION TO RUSSIAN LITERATURE I. 4 HOURS. Same as Russian 221. Old Russian literature from 988 to 1830: chronicles, lives of saints, sermons, and early secular works; *The Igor Tale.* Eighteenth century literature: Kantemir, Trediakovsky, Lomonosov, Sumarokov, Karamzin. Pushkin's *Eugene Onegin.* Early nineteenth century prose. Prerequisite: Junior standing or consent of the instructor.

232. INTRODUCTION TO RUSSIAN LITERATURE II. 4 HOURS. Same as Russian 222. Prose fiction from 1830 to 1880. Prose and poetry from 1880 to 1905. Special attention to the works of Pushkin, Lermontov, Gogol, Turgenev, Dostoevsky, and Tolstoy and to the "aesthetic revival" after 1890. Prerequisite: Junior standing or consent of the instructor.

233. INTRODUCTION TO RUSSIAN LITERATURE III. 4 HOURS. Same as Russian 223. Twentieth century literature from 1905 to the present; special attention to works by Gorky, Bunin, Sholokhov, Pasternak, and others. Prerequisite: Junior standing or consent of the instructor.

235. STUDIES IN EXISTENTIALIST LITERATURE. 4 HOURS. Same as Philosophy 235 and Religious Studies 235. Imaginative works by Dostoevsky, Rilke, Kafka, Sartre, and Camus; selections from Pascal, Kierkegaard, Nietzsche, Jaspers, and Tillich. Prerequisite: Junior standing or consent of the instructor.

240. SPANISH LITERATURE IN TRANSLATION I. 4 HOURS. Same as Spanish 240. Not open to Spanish majors or minors nor to students who have credit in courses above Spanish 200. Major works from the *Cid* to the end of the nineteenth century. Prerequisite: Sophomore standing or consent of the instructor.

241. SPANISH LITERATURE IN TRANSLATION II. 4 HOURS. Same as Spanish 241. Not open to Spanish majors or minors nor to students who have credit in courses above Spanish 200. Major works from 1898 to the present. Prerequisite: Sophomore standing or consent of the instructor.

248. MYTHOLOGY OF GREECE. 4 HOURS. Same as Classics 248 and Religious Studies 248. Intensive study of the gods and heroic sagas of the Greeks, through original sources in translation.

249. GREEK TRAGIC DRAMA IN TRANSLATION. 4 HOURS. Same as Classics 249. Knowledge of Greek is not required. The plays of Aeschylus, Sophocles, Euripides. Prerequisite: Junior standing or consent of the instructor.

251. GREEK POETRY IN TRANSLATION. 4 HOURS. Same as Classics 251. Knowledge of Greek is not required. Classical Greek poetry from its beginnings to the Byzantine period.

252. ROMAN SATIRE. 4 HOURS. Same as Classics 252. Knowledge of Latin is not required. Selections from Horace, Persius, Petronius, Seneca, Martial, and Juvenal.

253. THE INTELLECTURAL DEVELOPMENT OF GREECE. 4 HOURS. Same as Classics 253. Knowledge of Greek is not required. Selections from the philosophers, poets, historians, and scientists. Prerequisite: Junior or senior standing.

254. GREEK COMEDY IN TRANSLATION. 4 HOURS. Same as Classics 254. Knowledge of Greek is not required. The plays of Aristophanes and Menander. Prerequisite: Junior standing or consent of the instructor.

255. ROMAN COMEDY IN TRANSLATION. 4 HOURS. Same as Classics 255. Knowledge of Latin is not required. The plays of Plautus and Terence. Prerequisite: Junior standing or consent of the instructor.

256. GREEK AND ROMAN EPIC POETRY. 4 HOURS. Same as Classics 256. Knowledge of Greek and Latin is not required. The epic poems of Homer, Lucretius, Vergil, and others in the Greco-Roman tradition. Prerequisite: Junior standing or consent of the instructor.

257. CLASSICAL GREEK LITERATURE. 4 HOURS. Same as Classics 257. Survey of ancient Greek literature with readings from representative classic texts. Prerequisite: Junior standing or approval of the department.

259. CLASSICAL LITERARY CRITICISM. 4 HOURS. Same as Classics 259. Examination of the primary extant sources of literary criticism: Aristotle, *Poetics;* Horace, *Ars Poetica;* Pseudo-Longinus, *On the Sublime;* Quintilian, *Institutio Oratoria.* Knowledge of Greek or Latin is helpful but not essential. Prerequisite: Junior standing.

270. SURVEY OF LITERATURE OF THE WESTERN WORLD FROM THE MIDDLE AGES THROUGH THE RENAISSANCE. 4 HOURS. Chronological survey of the major works of Western literature. Prerequisite: 8 hours of literature or consent of the instructor.

271. SURVEY OF LITERATURE OF THE WESTERN WORLD FROM THE SEVENTEENTH THROUGH THE EIGHTEENTH CENTURY. 4 HOURS. Chronological survey of the major works of Western literature. Prerequisite: 8 hours of literature or consent of the instructor.

272. SURVEY OF LITERATURE OF THE WESTERN WORLD FROM THE NINETEENTH CENTURY TO THE PRESENT. 4 HOURS. Chronological survey of the major works of Western literature. Prerequisite: 8 hours of literature or consent of the instructor.

273. THE BIBLE AS LITERATURE I: THE OLD TESTAMENT. 4 HOURS. Same as Religious Studies 273. Historical and analytical study of the Old Testament portion of the English Bible; concentration on the King James Version, with attention to more recent revisions of that version. Prerequisite: Junior standing or consent of the instructor.

274. THE BIBLE AS LITERATURE II: THE APOCRYPHA AND THE NEW TESTAMENT. 4 HOURS. Same as Religious Studies 274. Historical and analytical study of the Apocrypha and New Testament portions of the English Bible; concentration on the King James Version, with attention to more recent revisions of that version. Prerequisite: Junior standing or consent of the instructor.

275. COLLOQUIUM ON GENRES AND MODES OF WORLD LITERATURE. 4 HOURS. May be repeated for a maximum of 12 hours. One particular genre or mode; emphasis on the close study of a limited number of works and on independent study, including oral and written reports. Prerequisite: 8 hours of literature or consent of the instructor.

276. COLLOQUIUM ON MOVEMENTS AND INFLUENCES ON WORLD LITERATURE. 4 HOURS. May be repeated for a maximum of 12 hours. One particular movement in or influence on world literature; emphasis on the close study of a limited number of works and on independent study, including oral and written reports. Prerequisite: 8 hours of literature or consent of the instructor.

277. COLLOQUIUM ON ETHNIC AND NATIONAL LITERATURE IN TRANSLATION. 4 HOURS. May be repeated for a maximum of 12 hours. One particular ethnic or national literature in translation; emphasis on the close study of a limited number of works and on independent study, including oral and written reports. Prerequisite: 8 hours of literature or consent of the instructor.

281. MONUMENTS AND INSTITUTIONS OF ROME. 4 HOURS. Same as Classics 281. Political and social institutions of Rome as they relate to the major monuments during the first two centuries of the empire.

282. ROMAN RELIGION. 4 HOURS. Same as Classics 282 and Religious Studies 282. Beliefs, practices, and institutions of Roman religion and cults from the early republic to A.D. 476.

288. THE INTELLECTUAL REVOLUTION OF THE SEVENTEENTH AND EIGHTEENTH CENTURIES AS VIEWED THROUGH THE ARTS. 4 HOURS. Same as History of Architecture and Art 288 and Music 288. Evidence in the visual arts and in music of the impact of the new cosmology on men's minds, imaginations, and emotions. Prerequisite: Sophomore standing.

289. NEW PERCEPTIONS IN VISUAL ARTS, MUSIC, AND SCIENCE. 4 HOURS. Same as Music 289. The extended sensory range of the twentieth century as represented in the visual arts, music, and science. Prerequisite: Sophomore standing.

INFORMATION ENGINEERING (InfE)

100. GENERAL BIOLOGY. 4 HOURS. Same as Biological Sciences 100. With Information Engineering 101 and 102, a three-quarter sequence which may be entered in any quarter. Audio-tutorial. Principles and fundamentals of biology through examination of diverse phenomena unique to biological systems. Lecture, laboratory, and discussion.

101. GENERAL BIOLOGY. 4 HOURS. Same as Biological Sciences 101. Continues Information Engineering 100.

102. GENERAL BIOLOGY. 4 HOURS. Same as Biological Sciences 102. Continues Information Engineering 101.

120. INTRODUCTION TO ELECTRICITY AND MAGNETISM. 4 HOURS. Essential elements of basic electricity and magnetism as summarized by Maxwell's equation in vector integral form. Prerequisite: Math. 133.

200. INTRODUCTION TO BIOENGINEERING. 4 HOURS. Fundamental aspects of some engineering problems presented by man, his society, his environment, and his interaction with machines. Topics indicate how engineering analysis may be applied to help solve some complex biological problems. Prerequisites: Math. 133 and Phys. 132 or the equivalents.

201. HISTORY OF ENGINEERING. 4 HOURS. Important elements in the growth of the art and science of engineering from ancient times to the present. Lives of some of the leaders. The effect of engineering on the social conditions of the various periods. Prerequisite: Junior standing or consent of the instructor.

210. INTRODUCTION TO CIRCUIT THEORY. 4 HOURS. Kirchhoff's laws; node and loop methods for network analysis; network theorems; power and energy; energy storage elements; exponential signals and linear differential equations; initial conditions; forced responses; network functions. Prerequisite: Credit or registration in InfE. 211, Phys. 132, and Math. 220.

211. INTRODUCTION TO CIRCUIT THEORY LABORATORY. 1 HOUR. Experimental counterpart of Information Engineering 210. Electronic instruments; electrical components; measurement methods; experiments in electrical circuits. Prerequisite: Credit or registration in InfE. 210.

212. SIGNAL PROCESSING. 4 HOURS. Exponential excitations and responses; signal representation in terms of Fourier series, Fourier transforms, bilateral and unilateral Laplace transforms; applications. Prerequisite: InfE. 210.

219. FIELDS AND WAVES I. 4 HOURS. Elements of vector calculus; static electric and magnetic fields; elementary electromagnetic theory as summarized in Maxwell's equations in integral and differential form. Prerequisites: Phys. 113 and Math. 220.

221. FIELDS AND WAVES II. 4 HOURS. Maxwell's equations in integral and differential form; static electric and magnetic fields; wave motion and introduction to radiation. Prerequisites: InfE. 212 and 219.

240. INTRODUCTION TO ELECTRONICS AND ELECTRONIC SYSTEMS. 4 HOURS. Comprehensive view of fundamental principles and processes underlying analysis and design of modern electronic systems; information transmission, current flow in solids, PN-junction, transistor models, and applications. 3 hours per week of laboratory experience and problem solving illustrating these principles. Prerequisites: InfE. 210, 211, and MatE. 230.

259. NEUROBIOLOGY. 3 HOURS. Same as Biological Sciences 259. Introduction to basic anatomical and physiological concepts of the human central nervous system. Prerequisite: One year of biological sciences or consent of the instructor.

280. VERTEBRATE MORPHOGENESIS. 5 HOURS. Same as Biological Sciences 280. Introduction to vertebrate anatomy; emphasis on early embryology and histology. Lecture and laboratory. Prerequisite: One year of biological sciences.

281. STRUCTURE AND DEVELOPMENT OF VERTEBRATES I. 5 HOURS. Same as Biological Sciences 281. With Information Engineering 282 a two-quarter sequence. Evolution of vertebrate organ systems; their embryogenesis and microscopic and gross anatomy. Lecture and laboratory. Prerequisite: InfE. 280.

282. STRUCTURE AND DEVELOPMENT OF VERTEBRATES II. 5 HOURS. Same as Biological Sciences 282. Continues Information Engineering 281. Prerequisite: InfE. 281.

283. GENETICS. 3 HOURS. No credit for information engineering majors unless credit is also obtained for Information Engineering 284. Same as Biological Sciences 240. Principles of heredity and variation illustrating the gene concept, genic structure, and primary function in growth and development. Lecture and discussion. Prerequisite: 12 hours in biological sciences. One year of college mathematics or organic chemistry is recommended.

284. GENETICS LABORATORY. 2 HOURS. 6 hours per week in the laboratory. Same as Biological Sciences 241. Experiments and demonstrations of heredity and variation using material from *drosophila,* corn, rodents, bacteria, fungi, and viruses. Prerequisite: Credit or concurrent registration in InfE. 283.

289. COOPERATIVE ENGINEERING PRACTICE. 0 HOURS. Same as Energy Engineering 289, Materials Engineering 289, and Systems Engineering 289. Off-campus participation in a government or industrial training program. Prerequisite: Enrollment in the cooperative engineering program.

290. COOPERATIVE ENGINEERING SEMINAR. 1 HOUR. Same as Energy Engineering 290, Materials Engineering 290, and Systems Engineering 290. Lectures and seminar for students in the cooperative engineering program. Prerequisite: InfE. 289, taken during the previous quarter.

292. UNDERGRADUATE RESEARCH. 2 TO 4 HOURS. Research under the close supervision of a faculty member. Prerequisite: Consent of the instructor.

307. CYBERNETICS I. 4 HOURS. Same as Systems Engineering 307. Introduction to artificial intelligence and pattern recognition by computer. Programs for playing games, proving theorems, answering questions, and making medical diagnoses. Property selection and decision-making techniques. Prerequisites: Math. 195 and either 250 or 370; or consent of the instructor.

311. LINEAR SYSTEMS ANALYSIS. 4 HOURS. Application of signal representations discussed in Information Engineering 212 to the analysis of linear systems; transform methods and frequency analysis; natural response, stability, signal flow graphs; Laplace transform with two variables; convolution integral and applications. Prerequisite: InfE. 212.

312. INTRODUCTION TO COMMUNICATION ENGINEERING. 4 HOURS. Introduction to communication systems; amplitude, frequency, and pulse-type modulation, time and frequency multiplexing, noise calculations and signal to noise ratio. Prerequisites: InfE. 311 or 340 or SysE. 315 or consent of the instructor.

315. INTERMEDIATE NETWORK ANALYSIS. 4 HOURS. Network theorems; introduction to topological approaches in general linear network analysis; loop, node, and state variable equations; network functions; the positive real concept. Prerequisite: InfE. 311.

316. INTRODUCTION TO NETWORK SYNTHESIS. 4 HOURS. Continues Information Engineering 315. Covers positive real functions, L-C synthesis, RC, RL, and RLC synthesis, and filter design. Prerequisite: InfE. 315.

320. FIELDS AND WAVES III. 4 HOURS. Transmission line equations. Transient phenomena; time-harmonic waves. Nonelectro-magnetic waves. Scattering matrix and applications. Prerequisite: InfE. 221.

324. PRINCIPLES OF MICROWAVES. 4 HOURS. Analysis of guided waves. Rectangular and circular cylindrical waveguides. Coaxial lines. Dielectric rod microwave devices. Microwave network theory. Prerequisite: InfE. 320.

325. ANTENNA ENGINEERING AND WAVE PROPAGATION. 4 HOURS. Radiation from current elements. Scalar and vector formulation for radiation and scattering. Theorems of antenna analysis. Antenna impedance. Arrays. Prerequisite: InfE. 320.

326. MICROWAVE SEMICONDUCTOR ELECTRONICS. 4 HOURS. Varactor diodes, parametric devices and harmonic generators. Tunnel, IMPATT and Gunn diodes, with applications. Prerequisites: InfE. 320 and 346.

327. MODERN LINEAR OPTICS. 4 HOURS. Two-dimensional Fourier analysis, linear invariant systems, sampling theory. Applications of transfer functions to scalar diffraction, gratings and lenses. Frequency analysis of imaging systems. Spatial filtering and optical information processing. Holography and its applications. Prerequisites: InfE. 212 and 221.

330. COMMUNICATION THEORY I. 4 HOURS. With Information Engineering 331, an introduction to statistical communication theory. Signal spectra, modulation, noise, probability theory; applications of statistics to communication systems. Prerequisite: InfE. 312.

331. COMMUNICATION THEORY II. 4 HOURS. Continues Information Engineering 330. Prerequisite: InfE. 330.

340. ELECTRONIC CIRCUITS. 4 HOURS. Analysis and design of analog and digital electronic circuits; basic circuit properties, linear amplifiers, stability, operational and multistage configurations, tuned amplifiers and oscillators. Practical laboratory experience. Prerequisite: InfE. 240, 311, and Math. 195.

344. ELECTRONIC SWITCHING, TIMING, AND PULSE CIRCUITS. 4 HOURS. Analysis of piecewise linear active networks; single time constant circuit evaluation; semiconductor devices as switching elements; clamping, coupling, regenerative switching, and linear sweep circuits; pulse transformers; negative-resistance devices. Prerequisites: InfE. 212 and 340.

345. INTEGRATED CIRCUIT APPLICATIONS AND SYSTEMS. 4 HOURS. Components in integrated circuits; digital integrated circuit families; linear wideband, differential, operational, and power amplifiers; operational amplifier design, analysis, and switching circuit applications; communication and data conversion circuits; digital information storage. Prerequisite: InfE. 344.

346. SEMICONDUCTOR ELECTRONICS. 4 HOURS. Electron and hole transport mechanisms in semiconductor devices; quantum approach to distributions and statistics, recombination and generation, p-n junctions, and transistors; practical laboratory experience. Prerequisites: InfE. 240 and credit or registration in Phys. 114.

347. THIN FILM DEVICES. 4 HOURS. Introduction to vacuum technology. Methods of fabrication of films; sputtering, evaporation, electron beam evaporation, and

chemical deposition. Physical properties of films. Application of such films as resistor, capacitor, transistor, diode, magnetic memory devices, and superconductors. Prerequisites: InfE. 340 and 346.

348. FIELD EFFECT DEVICES. 4 HOURS. Electronic processes in surface-controlled semiconductor and dielectric devices. Properties of MIS field effect capacitors and transistors, surface and interface effects, and fabrication techniques. Prerequisites MatE. 230, InfE. 340 and 346.

350. PROSTHESES AND ARTIFICIAL ORGANS. 4 HOURS. The special problems encountered in the design of organ replacements as engineering devices. Sub-organ replacements, circulatory assist devices, artificial kidneys and other organ systems. Prerequisites: InfE. 200, 383, 384, MatE. 230, and EnrE. 211, or the equivalents.

352. BIOCONTROL. 3 HOURS. Demonstration of the applicability of control systems theory to physiological systems, including the pupil system, eye and hand movement systems, and utilizing techniques such as Fourier analysis, Nyquist stability criteria, and cross-correlation. Prerequisites: InfE. 311 and 383 or 384; or consent of the instructor.

353. BIOCONTROL LABORATORY. 3 HOURS. Experimental counterpart of Information Engineering 352. Motor coordination, crayfish photoreceptor, human pupil eye movement. Prerequisite: Credit or registration in InfE. 352.

354. BIOINSTRUMENTATION: TRANSDUCERS. 4 HOURS. Consideration of energy conversion, with detailed discussion of transducers used in biological research. Prerequisites: InfE. 240 and 311.

356. MATERIALS IN BIOENGINEERING. 4 HOURS. Analysis of materials problems associated with the prostheses and other implanted devices (medical and dental). Prerequisites: MatE. 230, InfE. 383 or 384.

359. NEUROANATOMY. 5 HOURS. Same as Biological Sciences 359. Introduction to the neurological organization of the mammalian central nervous system. Prerequisites: BioS. 280 and consent of the instructor.

360. AUTOMATIC CONTROL THEORY I. 4 HOURS. Introductory mathematical preliminaries of control systems. Concept of feedback; transfer functions of typical electrical, mechanical, and hydraulic control systems; state variable representation of systems; signal flow graphs; implications of feedback on system performance; time domain analysis; stability concepts including Lyapunov, Routh-Hurwitz, and Nyquist stability criteria. Laboratory assignments include experimental determination of the response of typical control systems and analog computer simulations. Prerequisite: InfE. 311 or SysE. 315.

361. AUTOMATIC CONTROL THEORY II. 4 HOURS. Continues Information Engineering 360. Introduction to the design of feedback control systems. Frequency response methods, root locus, Nichols chart, compensation techniques. Introduction to modern control theory, matrix representation of linear systems and mode interpretations, concepts of controllability and observability, and linear time-varying systems. Projects involving intensive studies on servo systems and extensive simulations on digital or analog computers. Prerequisite: InfE. 360.

371. SWITCHING NETWORKS AND LOGICAL DESIGN. 4 HOURS. Provides a background of basic concepts common to digital systems. Coding and representation of information, nondecimal number systems, switching algebra, combinational logic, electronic implementation and representation of logic,

minimization techniques, analysis and synthesis of asycronous and synchronous networks, error correcting codes, hazards and races due to logical circuit delays. Prerequisite: Math. 195.

372. DESIGN OF DIGITAL SYSTEMS. 4 hours. Introduction to hardware design techniques, diode matrices, transistor circuits, storage elements, registers, adders, counters. Design philosophy, functional units and layout of digital computers, arithmetic and control operations. Prerequisite: InfE. 371.

373. COMPUTER ORGANIZATION AND ARCHITECTURE. 3 HOURS. Evolution of design concepts into system organization and hardware-software integration. Memory and input-output units, channel controllers, interrupt concepts, cycle stealing, examples of general purpose computer organization. Hardware-software tradeoffs. Introduction to machine languages, assemblers and loaders. Prerequisite: InfE. 372.

379. REAL-TIME DATA PROCESSING. 4 HOURS. Theory and techniques of data processing using analog and digital computers. Emphasis on the unique computational problems presented by biological data, illustrating the practical use of communication theory. Prerequisite: Math. 195 and 220.

383. ANIMAL PHYSIOLOGY I. 5 HOURS. Same as Biological Sciences 363. The role of the digestive, circulatory, respiratory, and osmoexcretory systems in the maintenance of organismic homeostasis. Emphasis on vertebrates. Lecture and laboratory. Prerequisite: InfE. 284.

384. ANIMAL PHYSIOLOGY II. 5 HOURS. Same as Biological Sciences 364. The role of the muscular, sensory, nervous, and endocrine systems in the maintenance of organismic integration. Emphasis on vertebrates. Lecture and laboratory. Prerequisite: InfE. 284.

391. SEMINAR. 1 TO 4 HOURS. Topics to be arranged. Prerequisite: Senior standing or consent of the instructor.

393. SPECIAL PROBLEMS. 2 TO 4 HOURS. May be repeated for credit. Special problems or reading by arrangement with the faculty. Prerequisite: Senior standing or consent of the instructor.

396. SENIOR DESIGN I. 4 HOURS. Same as Energy Engineering 396, Materials Engineering 396, and Systems Engineering 396. Introduction to engineering economics, legal and social constraints on design, safety and reliability theory, and the use of simulation and optimization techniques in the engineering design process. Prerequisite: Senior standing in the College of Engineering.

397. SENIOR DESIGN II. 4 HOURS. Same as Energy Engineering 397, Materials Engineering 397, and Systems Engineering 397. Application of principles of engineering and engineering design methodology to the solution of a large-scale design problem. May be taken in any department, regardless of area of concentration. Prerequisite: InfE. 396.

ITALIAN (Ital)

101. ELEMENTARY ITALIAN I. 4 HOURS. Two additional half hours per week in the language laboratory. For students without credit in Italian. Oral practice, reading, and grammar.

102. ELEMENTARY ITALIAN II. 4 HOURS. Two additional half hours per week in the language laboratory. Continues Italian 101. Prerequisite: Ital. 101 or the equivalent.

103. ELEMENTARY ITALIAN III. 4 HOURS. Two additional half hours per week in the language laboratory. Continues Italian 102. Prerequisite: Ital. 102 or the equivalent.

104. INTERMEDIATE ITALIAN I. 4 HOURS. Two additional half hours per week in the language laboratory. Rapid reading, grammar review, composition, conversation. Prerequisite: Ital. 103 or two years of high school Italian.

105. INTERMEDIATE ITALIAN II. 4 HOURS. Two additional half hours per week in the language laboratory. Continues Italian 104. Prerequisite: Ital. 104 or the equivalent.

106. INTERMEDIATE ITALIAN III. 4 HOURS. Two additional half hours per week in the language laboratory. Continues Italian 105. Prerequisite: Ital. 105 or the equivalent.

201. ITALIAN LITERATURE IN ENGLISH TRANSLATION I. 4 HOURS. Same as Humanities 201. Development from its origins to the fifteenth century. Lecture, reading, and discussion of major works. Prerequisite: Sophomore standing or consent of the instructor.

202. ITALIAN LITERATURE IN ENGLISH TRANSLATION II. 4 HOURS. Same as Humanities 202. Development from the sixteenth to the eighteenth century. Lecture, reading, and discussion of major works. Prerequisite: Sophomore standing or consent of the instructor.

203. ITALIAN LITERATURE IN ENGLISH TRANSLATION III. 4 HOURS. Same as Humanities 203. Development from the beginning of the nineteenth century to the present. Lecture, reading, and discussion of major works. Prerequisite: Sophomore standing or consent of the instructor.

211. INTERMEDIATE COMPOSITION AND CONVERSATION I. 3 HOURS. Practice in oral and written expression based on the study of contemporary Italian material; appropriate grammar review. Prerequisite: Ital. 106 or the equivalent.

212. INTERMEDIATE COMPOSTION AND CONVERSATION II. 3 HOURS. Continues Italian 211. Prerequisite: Ital. 211.

213. INTERMEDIATE COMPOSITION AND CONVERSATION III. 3 HOURS. Continues Italian 212. Prerequisite: Ital. 212.

215. READINGS IN ITALIAN LITERATURE. 3 HOURS. Readings vary from quarter to quarter; course may be repeated for credit each quarter readings change. Introduction to the reading of literary Italian through representative examples of modern drama and fiction. Prerequisite: Ital. 106 or consent of the instructor.

220. THE ITALIAN NOVEL OF THE TWENTIETH CENTURY. 3 HOURS. Main currents. Prerequisite: Ital. 106 or consent of the instructor.

221. ITALIAN POETRY OF THE TWENTIETH CENTURY. 3 HOURS. Development and nature of modern and contemporary Italian poetry. Prerequisite: Ital. 106 or consent of the instructor.

222. CONTEMPORARY ITALIAN DRAMA AND ESSAY. 3 HOURS. Development of Italian drama from Luigi Pirandello to the present. The twentieth century essay as a literary genre. Prerequisite: Ital. 106 or consent of the instructor.

299. INDEPENDENT STUDY. 1 TO 6 HOURS. Open only to qualified students majoring in a Romance language. Prerequisites: Proficiency in Italian and approval of the department.

305. ITALIAN LITERARY MOVEMENTS TO 1450. 4 HOURS. Major developments in Italian literature to 1450. Prerequisite: Two 200-level courses in Italian or consent of the instructor.

306. ITALIAN LITERARY MOVEMENTS FROM 1450 TO 1600. 4 HOURS. Continues Italian 305. Prerequisite Two 200-level courses in Italian or consent of the instructor.

307. ITALIAN LITERATURE FROM 1600 TO 1800. 4 HOURS. Continues Italian 306. Prerequisite: Two 200-level courses in Italian or consent of the instructor.

308. ITALIAN LITERATURE FROM 1860 TO THE PRESENT. 4 HOURS. Continues Italian 307. Prerequisite: Two 200-level courses in Italian or consent of the instructor.

JUDAIC STUDIES (Jud)

224. ANCIENT ISRAEL: ARCHAEOLOGICAL SOURCES. 3 HOURS. Archaeological discoveries in Palestine and other Near Eastern lands; their use in the study of ancient Israel.

228. WISDOM LITERATURE OF THE BIBLE. 3 HOURS. Nature and content of biblical wisdom as distinguished from the prophetic and legal writings of the Bible; the Wisdom Literature within the setting of the ancient Near East.

230. THE BOOK OF GENESIS IN THE CONTEXT OF THE ANCIENT NEAR EAST. 3 HOURS. The book of Genesis in the context of its contemporary Near Eastern literature.

232. THE BOOK OF JOB. 3 HOURS. Job in the light of talmudic, classical, and modern interpretations. Limitations of human knowledge and ability.

247. TALMUD AND CONTEMPORARY SOCIETY. 3 HOURS. May be repeated for a maximum of 12 hours. Legal, ethical, and social issues.

260. NEAR EASTERN ERA IN THE HISTORY OF THE JEWISH PEOPLE. 3 HOURS. The rise and development of the Jewish people. Its religious, social, and political institutions. The history of the Oriental Diaspora until the end of the Gaonate and Exilarchate.

399. INDEPENDENT STUDY. 1 TO 6 HOURS. May be repeated for credit. Independent research on various aspects of Italian culture and studies that are not covered in regular courses. Prerequisite: Consent of the instructor.

219. PENTATEUCH, PROPHETS AND WRITINGS: A SURVEY. 3 HOURS. Biblical narrative: its development and its place through the ages in *midrashic,* allegorical, and historical interpretation; biblical law in *midrash halachah* and modern scholarship.

220. WORLD OF THE BIBLE. 3 HOURS. A survey course on the Bible as a whole within the setting of the ancient Near East. Historical and critical introductions.

221. THE DEVELOPMENT OF THE BIBLICAL TEXT. 3 HOURS. The various approaches: traditional rabbinic views, the documentary theory, form criticism, and the evidence of the Qumran texts.

222. THE BIBLE: VERSIONS AND TRANSLATIONS. 3 HOURS. From the earliest versions, Samaritan and Greek, to the most recent translations.

223. ANCIENT ISRAEL: LITERARY SOURCES. 3 HOURS. A comprehensive study of the social, cultural, and religious history of ancient Israel using the biblical text and literary sources of the ancient Near East.

224. ANCIENT ISRAEL: ARCHAEOLOGICAL SOURCES. 3 HOURS. Archaeological discoveries in Palestine and other Near Eastern lands; their use in the study of ancient Israel.

225. BIBLICAL EXEGESIS. 3 HOURS. Critical explanation and interpretation of selected biblical texts with commentaries of Rashi, Rashbam, Ibn Ezra Nahmanides, Radak, and several modern commentaries. Prerequisite: Heb. 106 or the equivalent.

227. INTRODUCTION TO THE PROPHETIC WRITINGS. 3 HOURS. May be repeated for a total of 15 hours of credit. Selections from the books of Isaiah, Jeremiah, Ezekiel, Haggai, Zechariah, and Malachi with classical and modern commentaries.

228. WISDOM LITERATURE OF THE BIBLE. 3 HOURS. Nature and content of biblical wisdom as distinguished from the prophetic and legal writings of the Bible; the Wisdom Literature within the setting of the ancient Near East.

229. APOCRYPHA. 3 HOURS. Introduction to the apocrypha. Leading noncanonical books—poetic, prophetic, and narrative. Prerequisite: Heb. 106 or the equivalent.

230. THE BOOK OF GENESIS IN THE CONTEXT OF THE ANCIENT NEAR EAST. 3 HOURS. The book of Genesis in the context of its contemporary Near Eastern literature.

232. THE BOOK OF JOB. 3 HOURS. Job in the light of talmudic, classical, and modern interpretations. Limitations of human knowledge and ability.

233. QUMRANICA. 3 HOURS. Introduction to Qumranica. The Dead Sea Scrolls: problems of identification, interpretation, and relationship with other known traditions, communities, and literature.

234. EZRA, NEHEMIAH, AND ESTHER. 3 HOURS. Historical and literary background of the period. Selections from classical and modern commentaries. Prerequisite: Heb. 106 or the equivalent.

235. ECCLESIASTES. 3 HOURS. Introduction. Selections from classical and modern commentaries.

236. PROVERBS. 3 HOURS. Introduction. Selections from classical and modern commentaries. Prerequisite: Heb. 106 or the equivalent.

237. LEGAL TEXTS. 3 HOURS. The laws of the Pentateuch in the light of ancient Near Eastern legal literature.

238. LEVITICUS AND DEUTERONOMY. 3 HOURS. Introduction to biblical ethics; the priestly and Deuteronomic codes.

241. MISHNAH: TEXTS. 3 HOURS. Selected texts from the tractates of *Seder Nashim*.

242. BABYLONIAN TALMUD: INTRODUCTION. *BERAKOTH*. 3 HOURS. Introduction to the Talmud. Halachic and aggadic texts. Prerequisite: Heb. 106 or the equivalent.

243. MIDRASH. 3 HOURS. May be repeated for a total of 6 hours of credit. Introduction to the halachic and aggadic Midrashim. Readings from the *Mechilta* and the *Midrash Rabbah*. Prerequisite: Heb. 106 or the equivalent.

244. TALMUD: LEGAL DOCUMENTS. 3 HOURS. Documents dealing with personal life and business activities in Talmudic literature.

245. BABYLONIAN TALMUD: TEXTS. 3 HOURS. May be repeated for a total of 21 hours of credit. Introduction to various Sedarim and tractates of the Babylonian Talmud. Halachic and aggadic texts of various tractates with the commentaries of *Rashi* and *Tosafot*. Prerequisite: Heb. 106 or the equivalent.

246. THE TALMUDIN: A SURVEY. 3 HOURS. Similarities and differences between the Babylonian and Palestinian Talmud.

247. TALMUD AND CONTEMPORARY SOCIETY. 3 HOURS. May be repeated for a maximum of 12 hours of credit. Legal, ethical, and social issues.

248. ETHICAL TEXTS OF THE TALMUD. 3 HOURS. Selected ethical works in the 'minor Tractates' of the Talmud, including *The Fathers According to Rabbi Nathan*, the Tractates Kallah (Bride), and *Derek Erez* (Etiquette).

249. CODES OF MAIMONIDES AND KARO. 3 HOURS. May be repeated for a total of 6 hours of credit. Introduction; selected texts from the *Mishneh Torah* and the *Shulhan Aruk*.

250. RESPONSA LITERATURE. 3 HOURS. Selected responsa from ancient, medieval, and modern times.

251. LITURGY OF THE JEWISH PEOPLE. 3 HOURS. The origin and development of Jewish liturgy.

260. NEAR EASTERN ERA IN THE HISTORY OF THE JEWISH PEOPLE. 3 HOURS. The rise and development of the Jewish people. Their religious, social, and political institutions. The history of the oriental Diaspora until the end of the Gaonate and Exilarchate.

261. FROM THE EMERGENCE OF THE JEWISH PEOPLE TO THE END OF THE UNITED KINGDOM. 3 HOURS. Hebrew origins; sojourn in Egypt; the Exodus; conquest of Canaan; the period of the judges and the early kings.

262. FROM THE DEATH OF SOLOMON TO THE HASMONEAN REVOLUTION. 3 HOURS. The Divided Kingdom. The Prophets. The downfall of Israel and Judah. Babylonian captivity. Restoration. The Samaritans. Hellenistic Rule and Hasmonean Revolution. The Mediterranean Diaspora.

263. FROM THE HASMONEAN KINGDOM TO THE END OF THE TALMUDIC PERIOD. 3 HOURS. The Hasmonean Kingdom. Herod. Roman rule. The downfall of Judea. The Patriarchate. Bar Kokeba. Babylonian Jewry. Mishnah and Talmud.

264. THE HISTORY OF THE SECOND COMMONWEALTH. 3 HOURS. From the return to Zion to the fall of Jerusalem in 70.

265. EARLY CHRISTIANITY IN ITS JEWISH ENVIRONMENT. 3 HOURS. May be repeated for a total of 9 hours of credit. Early Jewish and Christian literary sources; comparison and analysis.

266. JEWRY FROM 500 TO 1300. 3 HOURS. The Jews in Muslim Spain; Franco-German Jewry; Jewish learning in Western Europe; the Jews in Italy and Byzantium. Prerequisite: Heb. 106 or the equivalent.

267. THE HISTORY OF THE JEWS IN THE MOSLEM WORLD. 3 HOURS. A comprehensive study of the political, social, communal, economic, religious, and cultural life of the Jews in the Moslem countries from the emergence of Islam to the present.

268. THE WESTERN ERA IN THE HISTORY OF THE JEWISH PEOPLE. 3 HOURS. The rise and development of the Western Diaspora until the establishment of the State of Israel.

269. THE JEWISH COMMUNITY IN PRE-CRUSADE EUROPE. 3 HOURS. Babylonian Jewry: communal organization, social, economic, and cultural history. The Jews in the Muslim empire. The Jews in the Holy Land and in Egypt. Maimonides.

270. DECLINE OF MEDIEVAL WESTERN JEWRY AND THE EMERGENCE OF A JEWISH COMMUNITY IN EASTERN EUROPE. 3 HOURS. The Crusades. The decline of Spanish Jewry. The explusion of the Jews from England, France, and Spain. The expulsion of Ashkenazic Jewry and the emergence of East European Jewry.

271. HISTORY OF THE JEWS IN RUSSIA. 3 HOURS. Comprehensive study of the political, social, communal, economic, religious, and cultural life of the Jews in Russia from antiquity to the present.

272. THE JEWISH PEOPLE IN THE SEVENTEENTH AND EIGHTEENTH CENTURIES. 3 HOURS. The reemergence of Jewish settlements in Holland and England. The emergence of the Jewish community in America. The great Messianic movements. The emergence of Hasidism. The religious struggles of the seventeenth century. The Cossack riots in the Ukraine.

273. ENLIGHTENMENT AND EMANCIPATION. 3 HOURS. The Haskalah movement. The French Revolution and emancipation. Religious reform.

274. THE JEWISH PEOPLE IN THE NINETEENTH AND TWENTIETH CENTURIES. 3 HOURS. Modern anti-semitism. The Jews in Eastern Europe and the great migratory movements. American Jewry. Zionism. World War I. The Holocaust. The emergence of the State of Israel.

275. ZIONISM. 3 HOURS. The history of the Zionist movement: origins and development. Creation of the State of Israel.

276. JEWISH CULTURE AND RELIGIOUS HISTORY IN THE OLD AND NEW WORLDS. 3 HOURS. May be repeated for credit. Origin, evolution, and growth of the religious alignments in Judaism; the medieval Jewish community; the ghetto; the Enlightenment; emancipation and its aftermath.

277. AMERICAN JEWISH COMMUNITY. 3 HOURS. Early origins. Religious, educational, and social institutions. Structure and organization.

278. ANTI-SEMITISM. 3 HOURS. Religious origins. Rise of anti-semitism in Europe. Racial theories. The Dreyfus affair. Protocols of the Elders of Zion. Judeophobia in America.

279. THE HOLOCAUST. 3 HOURS. European Jewry between the two World Wars. Events leading to the destruction of major European Jewish centers.

280. THE STATE OF ISRAEL. 3 HOURS. Historical background. Development of the State in its political, social, demographic, and cultural settings.

281. THE HISTORY AND DEVELOPMENT OF JEWISH ART. 3 HOURS. Development of Jewish art forms from the biblical period to the present.

282. JEWISH SECTS AND SECTARIANISM. 3 HOURS. The socio-political factors and their impact on the Jewish religion during the Second Commonwealth; the Samaritans; ethnic origin, history, and literature; the military colony at Elephantine; the Pharisees, Sadducees, Essenes, Zealots, Apocalyptists, and Qumranites, their political and religious views; Judaism and early Christianity.

284. THE CONCEPT OF THE MESSIAH. 3 HOURS. The history and development of Jewish messianism.

285. THE CLASSICAL PERIOD OF JEWISH PHILOSOPHY. 3 HOURS. The roots of Jewish philosophical speculation in premedieval times.

286. MEDIEVAL JEWISH PHILOSPHY. 3 HOURS. Personalities and sources of medieval Jewish philosophy.

287. MODERN JEWISH PHILOSOPHY. 3 HOURS. Traditional issues and their expression in modern Jewish philosophy.

288. MAIMONIDEAN STUDIES. 3 HOURS. Maimonides: studies in his life and his teachings.

289. PHILOSOPHICAL TEXTS. 3 HOURS. May be repeated for credit. Textual analysis and comparative approaches of the classics of Jewish medieval philosophy.

290. ETHICAL TEXTS. 3 HOURS. May be repeated for credit. Textual analysis and comparative themes in the classics of Jewish pietica.

291. INTRODUCTION TO JEWISH THEOLOGY. 3 HOURS. May be repeated for credit. Judaism as a covenant religion. Revelation: static or continuous. The nature of prophecy, law and love, the oral and the written law, exegesis as theology, the Torah as God's blueprint, divine and human elements in Scripture. Justifications for religious observance.

292. INTRODUCTION TO JEWISH MYSTICISM. 3 HOURS. The inception and development of early Jewish mysticism; the place of the mystical tradition in the history of Jewish thought and practice; unique qualities of Jewish mysticism; inducement and descriptions of the mystical experience; systems of theosophical speculation. Schools within Hasidic thought; mystical trends in modern philosophical, scientific, literary, political, and theological literature.

293. HOLOCAUST LITERATURE. 3 HOURS. A cross-disciplinary study of issues raised by the European Holocaust (1939-1945).

294. BIBLICAL THEOLOGY. 3 HOURS. The development of central theological problems in biblical thought. The Bible as the root of postbiblical theology.

295. RABBINIC THEOLOGY. 3 HOURS. Examination of central theological issues in rabbinic thought utilizing a variety of contemporary approaches.

296. CONTEMPORARY JEWISH THOUGHT. 3 HOURS. Problems, trends, and developments.

297. INTRODUCTION TO JEWISH ETHICS. 3 HOURS. Relations among individuals; such issues as I and Thou, apathy and empathy, choosing a sex ethic.

298. MARTIN BUBER: HIS LIFE AND WORKS. 3 HOURS. A descriptive and critical analysis of the philosophy of Martin Buber. Stress is placed on Judaism in his work.

299. INDEPENDENT STUDY. 3 TO 6 HOURS. May be repeated for credit. Individual study under faculty direction. Prerequisite: Approval of the department.

LANGUAGE LABORATORY (LangL)

For students taking foreign language courses that require the use of the Language Laboratory. Intensive oral-aural practice. Two to six half hours per week. The student keeps a record of his own attendance, which becomes part of the instructor's record of performance in the course.

LATIN (Lat)

101. ELEMENTARY LATIN I. 4 HOURS. For students who have no credit in Latin. Grammar and reading. One additional half hour per week in the language laboratory. F

102. ELEMENTARY LATIN II. 4 HOURS. Continues Latin 101. Grammar and reading of easy prose and poetry. One additional half hour per week in the language laboratory. Prerequisite: Lat. 101 or the equivalent. W

103. ELEMENTARY LATIN III. 4 HOURS. Review of grammar; reading of prose. One additional half hour per week in the language laboratory. Prerequisite: Lat. 102 or two years of high school Latin. S

104. INTERMEDIATE LATIN I. 4 HOURS. Selected readings in prose and poetry. Review of forms and grammar. One additional half hour per week in the language laboratory. Prerequisite: Lat. 103 or two years of high school Latin. F

105. INTERMEDIATE LATIN II. 4 HOURS. Continues Latin 104. One additional half hour per week in the language laboratory. Prerequisite: Lat. 104 or the equivalent. W

106. INTERMEDIATE LATIN III. 4 HOURS. Continues Latin 105. One additional half hour per week in the language laboratory. Placement by proficiency examination. Prerequisite: Lat. 105 or the equivalent. S

109. HONORS COURSE I. 4 HOURS. *Note:* A student must have credit in Latin 110 and 111 to receive credit in 109. Rapid reading of Latin prose. Prerequisite: Three or four years of high school Latin with a B average or better or Lat. 106 or advanced placement by examination or consent of the instructor.

110. HONORS COURSE II. 4 HOURS. *Note:* A student must have credit in Latin 109 and 111 to receive credit in 110. Rapid reading of Latin poetry. Prerequisite: Three or four years of high school Latin with a B average or better or Lat. 109 or advanced placement by examination or consent of the instructor.

111. HONORS COURSE III. 4 HOURS. *Note:* A student must have credit in Latin 109 and 110 to receive credit in 111. Individual assignments at the discretion of the instructor. Rapid reading of Latin prose and poetry. Prerequisite: Three or four years of high school Latin with a B average or better or Lat. 110 or advanced placement by examination or consent of the instructor.

201. SURVEY OF LATIN LITERATURE I. 4 HOURS. *Note:* A student must have credit in Latin 202 and 203 to receive credit in 201. Writings of the early period. Prerequisite: Lat. 106 or the equivalent.

202. SURVEY OF LATIN LITERATURE II. 4 HOURS. *Note:* A student must have credit in Latin 201 and 203 to receive credit in 202. Writings of the middle period. Prerequisite: Lat. 201.

203. SURVEY OF LATIN LITERATURE III. 4 HOURS. *Note:* A student must have credit in Latin 201 and 202 to receive credit in 203. Writings of the late period. Prerequisite: Lat. 202.

204. CATULLUS: *CARMINA.* 4 HOURS. All the poems of Catullus, with special attention to the lyrics. Prerequisite: Lat. 106 or the equivalent.

205. PLINY THE YOUNGER: *EPISTULAE.* 4 HOURS. Selections from the correspondence. Prerequisite: Lat. 106 or the equivalent.

206. CICERO: PHILOSOPHIC ESSAYS I. 4 HOURS. Selections from *De Amicitia, De Senectute, Tusculanae Disputations, De Officiis.* Prerequisite: Lat. 106 or the equivalent.

207. TERENCE: *FABULAE.* 4 HOURS. Selections from two or more plays. Prerequisite: Lat. 106 or the equivalent.

208. CICERO: ORATIONS. 4 HOURS. Introduction to Cicero as an orator and statesman through the reading of selections from his orations. Prerequisite. Lat. 106 or the equivalent.

209. VERGIL: *AENEID.* 4 HOURS. Reading of selections. Prerequisite: Lat. 106 or the equivalent.

210. PLAUTUS I. 4 HOURS. Introduction to Roman comedy; reading of at least one of the following plays in Latin: *Captives, The Brothers Menaechmus, The Braggart Soldier.* Prerequisite: Lat. 106 or the equivalent.

211. PROSE COMPOSITION. 4 HOURS. Extensive translation from English to Latin; review of grammar and forms. Prerequisite: Lat. 106 or the equivalent.

251. OVID: *METAMORPHOSES,* SELECTIONS. 4 HOURS. Reading and translation of selected books and myths from the *Metamorphoses.* Prerequisite: Lat. 106 or the equivalent.

252. LIVY: *AB URBE CONDITA,* SELECTIONS. 4 HOURS. Reading and translation of selected books from Livy's *History of Rome.* Prerequisite: Lat. 106 or the equivalent.

260. HORACE: *ODES* I. 4 HOURS. Reading of a substantial portion of the *Odes.* Prerequisite: Lat. 106 or the equivalent.

261. HORACE: *SATIRES.* 4 HOURS. Reading of the *Satires.* Prerequisite: Lat. 106 or the equivalent.

270. TACITUS: MINOR WORKS. 4 HOURS. Introduction to Tacitus; reading of selections from the *Dialogus, Agricola,* and *Germania.* Prerequisite: Lat. 106 or the equivalent.

281. COMPARATIVE GRAMMAR OF GREEK AND LATIN. 4 HOURS. Same as Greek 281. Required of all students planning to do graduate work in classics, Comparative study of the sounds, inflections, word-formation, and syntax of Greek and Latin. Prerequisites: Gr. 103 and Lat. 103 or the equivalents.

299. INDEPENDENT STUDY. 4 HOURS. Individual study under faculty direction. For students qualified by preparation and interest. Prerequisite: Lat. 201 or the equivalent.

301. *CORPUS CAESARIANUM.* 4 HOURS. For advanced undergraduates, graduates, secondary school teachers of Latin, and prospective teachers. Rapid reading of Latin prose, based on the *Corpus Caesarianum;* discussion of the linguistic, literary, social, and political aspects that contribute to the understanding of the texts read. Prerequisites: Junior standing in Latin; at least one year of Latin beyond Lat. 106.

302. TIBULLUS AND PROPERTIUS. 4 HOURS. Reading and interpretatin of selections from their chief elegiac poems. Prerequisite: 4 hours of Latin at the 200 level or the equivalent.

304. SENECA: PROSE WORKS. 4 HOURS. Reading of two or more of the *Moral Essays* and/or a selection of the *Letters.* Prerequisite: 4 hours of Latin at the 200 level or the equivalent.

305. SENECA: *TRAGEDIES.* 4 HOURS. Reading and interpretation of one or more of the *Tragedies.* Prerequisite: 4 hours of Latin at the 200 level or the equivalent.

306. CICERO: PHILOSOPHIC ESSAYS II. 4 HOURS. Reading of two or more books from among *De Finibus, De Natura Deorum, De Divinatione, Academici;* study of related problems. Prerequisite: One 200-level course in Latin or the equivalent.

308. CICERO: LETTERS. 4 HOURS. Reading and translation of selections of the *Letters to Atticus* and the *Letters to his Friends.* Prerequisite: 8 hours of Latin at the 200 level or the equivalent.

309. VERGIL: *ECLOGUES* AND *GEORGICS.* 4 HOURS. Reading and analysis of selections from Vergil's earlier works. Prerequisite: 8 hours of Latin at the 200 level.

310. PLAUTUS II. 4 HOURS. Advanced studies in Roman comedy and the reading of two or more plays not read in Latin 210. Prerequisite: At least 8 hours of Latin at the 200 level or the equivalent.

340. LUCRETIUS. 4 HOURS. Reading and interpretation of extensive selections from *De rerum natura.* Prerequisite: 4 hours of Latin at the 200 level or the equivalent.

348. ST. AUGUSTINE: *THE CONFESSIONS.* 4 HOURS. The autobiographical portions of *The Confessions.* Prerequisite: One 200-level course in Latin.

350. MEDIEVAL LATIN. 4 HOURS. Literary and linguistic study of Latin texts originating between 350 and 1350 A.D. Prerequisites: Lat. 106 and 203 or the equivalents.

351. OVID: ELEGIAC POETRY. 4 HOURS. Reading and analysis of the chief elegiac poems. Prerequisite: 4 hours of Latin at the 200 level or the equivalent.

360. HORACE: *ODES* II AND *EPODES.* 4 HOURS. More extensive study of the *Odes,* with the addition of the *Epodes.* Prerequisite: One 200-level course in Latin.

361. HORACE: *EPISTLES.* 4 HOURS. Reading and interpretation of the *Epistles.* Prerequisite: 8 hours of Latin at the 200 level or the equivalent.

362. JUVENAL: *SATURAE.* 4 HOURS. Selections from the sixteen extant satires. Prerequisite: 8 hours of Latin at the 200 level or the equivalent.

370. TACITUS: ANNALS AND HISTORIES. 4 HOURS. Intensive study of the early empire and the historiography of Tacitus; extensive reading in the works. Prerequisite: At least 8 hours of Latin at the 200 level or the equivalent.

381. ROMAN LITERARY CRITICISM. 4 HOURS. The principal contributions of Latin writers to the study of literature. Prerequisite: At least 12 hours of Latin at the 200 level or the equivalent.

382. ROMAN RHETORIC. 4 HOURS. Requirement for all Latin majors. The contributions of writers in Latin to the study and practice of rhetoric. Prerequisite: At least 12 hours of Latin or the equivalent.

384. ROMAN SATIRE. 4 HOURS. Study of the definition, development, and problems of the genre through selections from the principal writers of satire. Prerequisite: 8 hours of Latin at the 200 level or the equivalent.

390. THE TEACHING OF LATIN IN THE SECONDARY SCHOOL. 4 HOURS. Theory and practice in foreign language instruction as they apply specifically to teaching Latin at the secondary level; objectives of instruction in Latin, historical

perspectives, texts, and materials of instruction; preprofessional orientation. Prerequisite: At least 8 hours of Latin at the 300 level or approval of the department.

LATIN AMERICAN STUDIES (LASt)

161. INTRODUCTION TO LATIN-AMERICAN HISTORY. 4 HOURS. Same as History 161. Survey of certain aspects of Latin-American civilization in their historical setting.

165. AFRO AND LATIN AMERICAN CULTURES OF NORTH AMERICA. 4 HOURS. Same as Anthropology 165 and Black Studies 165. A synchronic and diachronic survey of the subcultures of minority populations in North America; emphasis on Black and Latin American groups that have emerged in urban areas.

170. MASTERPIECES OF LUSO-BRAZILIAN LITERATURE IN ENGLISH TRANSLATION. 4 HOURS. May be repeated for credit each quarter topics change. Same as Humanities 170 and Portuguese 170. Representative works with background material.

171. READINGS IN LUSO-BRAZILIAN CULTURE IN ENGLISH TRANSLATION. 4 HOURS. Same as Humanities 171 and Portuguese 171. Selected topics. May be repeated for credit each quarter topics change.

187. MASTERPIECES OF SPANISH LITERATURE IN ENGLISH TRANSLATION. 4 HOURS. Same as Humanities 187 and Spanish 187. Not open to Spanish majors.

215. MIDDLE AMERICA. 4 HOURS. Same as Geography 262. Physical landscapes and the human cultural, economic, and political responses to them in Mexico, Central America, and the West Indies. Prerequisite: Geog. 160 or two 200-level systematic geography courses.

216. SOUTH AMERICA. 4 HOURS. Same as Geography 263. Regional geography; physical regions, people, economic resources, and political alignments. Prerequisite: Geog. 160 or two 200-level systematic geography courses.

222. SPANISH-AMERICAN LITERATURE IN TRANSLATION. 4 HOURS. Same as Spanish 242. Not open to Spanish majors or minors nor to anyone with credit in Spanish courses above the 200 level. Major works from the beginning of Spanish-American literature to the present; special emphasis on the nineteenth and particularly the twentieth centuries. Prerequisite: Sophomore standing or consent of the instructor.

223. SPANISH-AMERICAN FICTION OF THE TWENTIETH CENTURY I. 4 HOURS. Same as Spanish 223. Readings in contemporary Spanish-American novelists and short story writers. Prerequisite: Span. 106 or 120 or four years of high school Spanish or the equivalent.

224. SPANISH-AMERICAN FICTION OF THE TWENTIETH CENTURY II. 4 HOURS. Same as Spanish 224. Continues Latin American Studies 223. Prerequisite: LASt. 223.

232. HISPANIC-AMERICAN CULTURE. 4 HOURS. Same as Spanish 232. Required for teacher education majors in Spanish. Consideration of the cultural aspects of

Spanish-American civilization. Prerequisite: Any 200-level literature course or consent of the instructor.

233. LATIN-AMERICAN CULTURE IN CHICAGO. 4 HOURS. Same as Spanish 233. Organizations and major activities of the predominant *latino* groups in Chicago: Mexican, Puerto Rican, and Cuban. Prerequisite: Any 200-level course in Spanish or consent of the instructor.

241. BICULTURAL EDUCATION: SPANISH SPEAKING. 4 HOURS. Same as Education 241. Sociology of how people who have experienced discrimination learn; psychology and sociology of racial prejudice; the industrial city and minority groups; subculture and contraculture and their relationship to the educative process.

242. BICULTURAL EDUCATION: COMPARATIVE STUDY. 4 HOURS. Same as Education 242. Cultural matrix of the bilingual child. Comparative study of Mexican-American, Puerto Rican, and United States cultural patterns of family, stratum, and status, role of the teacher, and verbal and nonverbal communication.

243. CULTURAL MATRIXES OF THE SPANISH-SPEAKING CHILD. 4 HOURS. Same as Education 243. A one-quarter survey of Puerto Rican cultural patterns; special attention to the formation of Puerto Rican culture. The colonial heritage of Spanish and indigenous societies in the formation of modern Puerto Rico. Special attention to Puerto Rican institutional development in its relationship to the forces that determine a national character throughout the Hispanic colonial world; the relevance of the resulting institution is stressed. Prerequisite: Proficiency in Spanish.

244. PUERTO RICO: SOCIAL CHARACTER AND SOCIAL STRUCTURE FOR EDUCATORS. 8 HOURS. Same as Education 244. Intensive study of the cultural vectors determining the character and the history of the Puerto Rican people; emphasis on the interrelationship between culture and education. Prerequisite: Proficiency in Spanish.

248. HISTORY OF SPANISH-SPEAKING MINORITY GROUPS FOR URBAN EDUCATORS. 4 HOURS. Same as Education 248. A one-quarter survey of the historical roots of the educational experiences and attitudes of Spanish-speaking minority groups. Prerequisite: Junior standing.

249. GEOGRAPHICAL ORIGINS OF SPANISH-SPEAKING MINORITY GROUPS IN URBAN EDUCATION. 4 HOURS. Same as Education 249. A one-quarter survey of Latin-American educational patterns as they affect the urban school experiences of Spanish-speaking minority groups. A comparison of the American Indian and the Mediterranean attitudes toward school participation, especially in urban schools of the United States. Prerequisite: Junior standing.

252. NEW WORLD ARCHAEOLOGY I. 4 HOURS. Same as Anthropology 252. Introduction to the prehistoric cultures of the New World from the populating of the Americas to the beginning of the formative cultural period in the Americas. Prerequisite: Anth. 150.

253. NEW WORLD ARCHAEOLOGY II. 4 HOURS. Same as Anthropology 253. Introduction to the prehistoric cultures of the New World from the formative cultural period to the high civilizations of Mesoamerica and South America. Prerequisite: Anth. 150.

254. ETHNOGRAPHY OF MESOAMERICA. 4 HOURS. Same as Anthropology 261. Preconquest civilization of Mesoamerica, the interaction of Spanish and indigenous cultures, and the present Indian cultures of this area. Prerequisite: Anth. 160 or the consent of the instructor.

255. ETHNOGRAPHY OF SOUTH AMERICA. 4 HOURS. Same as Anthropology 265. A survey of the indigenous cultures in South America in the ethnographic present. Prerequisite: Anth. 160 or consent of the instructor.

261. COLONIAL LATIN AMERICA. 4 HOURS. Same as History 261. Iberian discovery, conquest, and settlement of America; the establishment of Spanish and Portuguese institutions; social, economic, political, and cultural development in colonial societies from conquest to independence. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

262. LATIN AMERICA IN THE NINETEENTH CENTURY. 4 HOURS. Same as History 262. The independence of Latin America and the establishment of the new nations. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

263. MODERN LATIN AMERICA. 4 HOURS. Same as History 263. The Latin American nations in the twentieth century; their social, economic, political, and cultural development and their struggle for modernization. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

264. COLONIAL MEXICO. 4 HOURS. Same as History 264. The Indian background of Mexico, the Spanish conquest, the amalgamation of Spanish and indigenous cultures, and the evolution of Mexican economic, religious, social, and political institutions under Spanish domination until 1821. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

265. THE MEXICAN NATION FROM 1821 TO 1910. 4 HOURS. Same as History 265. Social, economic, political, and cultural development from independence to the fall of Porfirio Diaz. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

266. MEXICO SINCE 1910. 4 HOURS. Same as History 266. The Mexican Revolution and the development of the modern nation. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

267. THE ESTABLISHMENT OF THE BRAZILIAN NATION: 1500 TO 1850. 4 HOURS. Same as History 267. Portuguese discovery, settlement, and exploitation of Brazil during three centuries; creation of the Brazilian nation through an amalgamation of races and cultures in a plantation and mining economy; the establishment and consolidation of independence. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

268. MODERN BRAZIL FROM 1850 TO THE PRESENT. 4 HOURS. Same as History 268. The empire of Pedro II, the antislavery struggle, the Conservative republic, the Vargas era, social and cultural development, and the struggle for democracy and modernization. Prerequisite: 4 hours of history at the 100 level or junior standing or approval of the department.

280. INTRODUCTION TO THE POLITICS OF DEVELOPING NATIONS. 4 HOURS. Same as Political Science 280. Comparative study of the political, economic, and

social characteristics of underdeveloped nations. Colonialism, nationalism, political ideologies, and problems of effective political organization and functions. Prerequisite: PolS. 100 or 120 or 152 or two courses in social science.

282. GOVERNMENT AND POLITICS OF LATIN AMERICA. 4 HOURS. Same as Political Science 242. Comparative examination of the governments and politics of selected Latin American countries. Patterns of political leadership and fellowership, governmental processes, problems of development, and foreign political influence. Prerequisite: PolS. 152 or 280 or two courses in social science.

299. INDEPENDENT STUDY. 2 TO 8 HOURS. May be repeated for credit. Selected topics for individual investigation. Prerequisite: Consent of the instructor and the Latin American Studies Program coordinator.

308. SPANISH-AMERICAN LITERATURE TO 1888 I. 4 HOURS. Same as Spanish 308. Development from the sixteenth century through the end of the Romantic period. Prerequisite: LASt. 223 or 224 or the equivalent.

309. SPANISH-AMERICAN LITERATURE TO 1888 II. 4 HOURS. Same as Spanish 309. Continues Latin American Studies 308. Prerequisite: LASt 223 or 224.

310. *MODERNISMO* AND CONTEMPORARY SPANISH-AMERICAN POETRY I. 4 HOURS. Same as Spanish 310. Spanish-American poetry from 1888 to the present with some *Modernista* prose. Prerequisite: LASt 223 or 224.

311. *MODERNISMO* AND CONTEMPORARY SPANISH-AMERICAN POETRY II. 4 HOURS. Same as Spanish 311. Continues Latin American Studies 310. Prerequisite: LASt 223 or 224.

323. THE CONTEMPORARY SPANISH-AMERICAN NOVEL I. 4 HOURS. Same as Spanish 323. From the Romantic period to 1930. Prerequisite: LASt 223 or 224 or the equivalent.

324. THE CONTEMPORARY SPANISH-AMERICAN NOVEL II. 4 HOURS. Same as Spanish 324. Continues Latin American Studies 323. From 1930 to the present. Prerequisite: LASt 223 or 224.

334. ECONOMIC DEVELOPMENT. 4 HOURS. Same as Economics 334. Basic problems and characteristics of underdeveloped countries; classical, neoclassical, and modern contributions to the theory of development; major proposals for accelerating development; basic approaches to economic development; laissez-faire, interventionism; role and methods of planning; foreign aid; and economic integration. Prerequisite: Econ. 320 or 321.

354. PROBLEMS IN MESOAMERICAN ETHNOLOGY. 4 HOURS. Same as Anthropology 361. Intensive investigation of selected problems from the Mesoamerican area; special emphasis on religion, economics, and social organization. Prerequisite: LASt. 254 or consent of the instructor.

361. TOPICS IN LATIN AMERICAN HISTORY. 4 HOURS. May be repeated for credit. Same as History 361. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.

367. PROBLEMS IN SOUTH AMERICAN ETHNOLOGY. 4 HOURS. Same as Anthropology 367. Intensive reading and research in theoretical and ethnographic problems in South American Indian social structures and cultures. Special

attention is given to the influence of Levi-Strauss' ideas on the formulation of cultural theory in South America. Prerequisite: Anth. 213 or LASt. 255 or consent of the instructor.

381. SEMINAR: POLITICAL PROBLEMS OF DEVELOPING SOCIETIES. 4 HOURS. Same as Political Science 381. Selected aspects of the politics of the countries of Asia, Africa, and Latin America. Prerequisite: PolS. 280.

LIBERAL ARTS AND SCIENCES (LAS)

299. LIBERAL ARTS AND SCIENCES STUDY ABROAD. 0 TO 16 HOURS. May be repeated for a maximum of 48 hours per academic year or for a total of 64 hours, all of which must be earned within one calendar year. Final determination of appropriate credit is made on the student's completion of the work. Provides credit for foreign study. The student's proposal for study abroad must have prior approval of the major department and the College of Liberal Arts and Sciences Office. Prerequisite: Permission of the student's major department and the College Office.

LINGUISTICS (Ling)

199. FOREIGN LANGUAGE PROFICIENCY. 4 TO 24 HOURS. Special arrangements for proficiency examinations in languages not regularly taught as part of the curriculum of the College of Liberal Arts and Sciences.

305. INTRODUCTION TO LINGUISTICS. 4 HOURS. Introduction to the theories and methods of the phonological, morphological, and syntactic analysis of language. Prerequisite: Junior standing.

307. HISTORY OF LINGUISTIC SCIENCE. 4 HOURS. Development of linguistic thought from its historical beginnings to the present. Prerequisite: Ling. 305, or junior standing and consent of the instructor.

310. PHONETICS AND PHONEMICS. 4 HOURS. Introduction to articulatory phonetics and phonemic analysis. Practice in transcription of utterances from English and other languages. Prerequisite: Ling. 305, or junior standing and consent of the instructor.

320. MORPHOLOGY. 4 HOURS. Introduction to the theories and methods of morphological analysis. Prerequisite: Ling. 310, or junior standing and consent of the instructor.

330. SYNTAX. 4 HOURS. Introduction to the theories and methods of syntactic analysis. Prerequisite: Ling. 320, or junior standing and consent of the instructor.

340. COMPARATIVE AND HISTORICAL LINGUISTICS. 4 HOURS. The comparative and diachronic study of languages. Prerequisite: Ling. 310, or junior standing and consent of the instructor.

352. APPLIED LINGUISTICS. 4 HOURS. Study of a selected topic, such as the problems of literary style, rhetoric, metrics, or the construction of pedagogical grammars. Content varies. Prerequisite: Ling. 305, or junior standing and consent of the instructor.

353. DIALECTOLOGY. 4 HOURS. Geographical and social variations in languages. Prerequisite: Ling. 310, or junior standing and consent of the instructor.

356. FIELD METHODS IN LINGUISTICS. 4 HOURS. The description of a language using data supplied by native speakers. Prerequisite: Ling. 310, or junior standing and consent of the instructor.

374. THE PSYCHOLOGY OF LANGUAGE. 4 HOURS. Same as Psychology 354 and Speech and Theater 354. Introductory survey of methods, theory, and research; acquaints students with the history and present status of psychology's interest in language behavior. Prerequisite: Consent of the instructor.

380. PROBLEMS IN LINGUISTIC ANALYSIS. 4 HOURS. Same as Anthropology 380. Examination of the methods and techniques used in linguistics, with reference to actual language data; emphasis on anthropological applications. Prerequisite: Anth. 280 or Ling. 305 or consent of the instructor.

LITHUANIAN (Lith)

101. ELEMENTARY LITHUANIAN I. 4 HOURS. Four class meetings per week and additional language laboratory experience. Introduction to phonology, morphological patterns, fundamental syntax, and functional vocabulary of modern Lithuanian.

102. ELEMENTARY LITHUANIAN II. 4 HOURS. Four additional half hours per week in the language laboratory. Continues Lithuanian 101. Prerequisite: Lith. 101 or the equivalent.

103. ELEMENTARY LITHUANIAN III. 4 HOURS. Four additional half hours per week in the language laboratory. Continues Lithuanian 102. Prerequisite: Lith. 102 or the equivalent.

104. INTERMEDIATE LITHUANIAN I. 4 HOURS. Intensive review of grammar; additional syntactic structures; oral readings and translation. Prerequisite: Lith. 103 or the equivalent.

105. INTERMEDIATE LITHUANIAN II. 4 HOURS. Continues Lithuanian 104. Prerequisite: Lith. 104 or the equivalent. Students who have not taken Lithuanian 104 at Chicago Circle must pass the Lithuanian placement test.

106. INTERMEDIATE LITHUANIAN III. 4 HOURS. Continues Lithuanian 105. Prerequisite: Lith. 105 or the equivalent. Students who have not taken Lithuanian 105 at Chicago Circle must pass the Lithuanian placement test.

331. HISTORY OF THE LITHUANIAN LANGUAGE. 4 HOURS. Development of Lithuanian from its Indoeuropean origins to the formation of the standard language; the conservative aspects of Lithuanian and its relation to Slavic. Prerequisite: 24 hours of Lithuanian or the equivalent or Ling. 305.

MANAGEMENT (Mgmt)

330. ORGANIZATIONAL PSYCHOLOGY. 4 HOURS. Same as Psychology 330. Individual psychological and group processes and their interaction with organizational structure. Behavioral factors in effective organizational change. Prerequisites: Psch. 130 and one course in social psychology, or the equivalents.

333. MOTIVATION AND MORALE IN INDUSTRY. 4 HOURS. Same as Psychology 333. Concepts and methods in the assessment and modification of employee motivation, attitudes, and morale. Prerequisite: 12 hours of psychology, including Psch. 332 or the equivalent.

335. PSYCHOLOGY OF INDUSTRIAL TRAINING. 4 HOURS. Same as Psychology 335. Psychological measurement techniques in assessing training needs and evaluating training effectiveness. Application of psychological techniques to the development of industrial training programs. Prerequisite: Psch. 332 or the equivalent.

338. PSYCHOLOGY OF INDUSTRIAL CONFLICT. 4 HOURS. Same as Psychology 338. Behavioral analysis of the causes, dimensions, and modes of resolution of industrial conflict; special emphasis on labor-management relations. Prerequisite: Psch. 330 or the equivalent.

350. ORGANIZATION AND ADMINISTRATION. 4 HOURS. Theories of management; concepts of organization; major functions of management; fundamentals of decision making. Emphasis on the role of management and administration within the business firm. Prerequisite: QM 270.

351. ORGANIZATION THEORY. 4 HOURS. Important theories of organization: their foundation, application, and consequences in the attainment of individual and organization objectives. Emphasis on formal and informal aspects of organizations, authority relationships, and structural aspects. Prerequisite: Mgmt. 350.

352. ADMINISTRATIVE PRACTICES. 4 HOURS. Examination of executive and manager behavior in working organizations. Analysis of human problems and relationships at work. Leadership styles, problems of motivation and attitudes. Emphasis on behavioral science theory and technology as applied to business. Case method of analysis and study. Prerequisite: Mgmt. 351.

353. PERSONNEL MANAGEMENT. 4 HOURS. The foundation, history, and objectives of manpower management; motivation and supervision; selection, training, and discipline; union-management relations; wage-and-salary administration; personnel research. Prerequisite: Mgmt. 350.

354. INDUSTRIAL RELATIONS SYSTEMS. 4 HOURS. Analysis of labor unions and their impact on business firms and society. Types of labor-management relationships and collective bargaining practices. Examination of public policy, union structure, and bargaining theory. Prerequisite: Mgmt. 353 or the equivalent.

355. OPERATIONS AND SYSTEMS MANAGEMENT I. 4 HOURS. Application of management sciences to planning and design of operational systems. Emphasis on strategic planning, selection of objectives, use of technological forecasts, responses to technological change and system controls. Prerequisite: QM 272 or the equivalent.

356. OPERATIONS AND SYSTEMS MANAGEMENT II. 4 HOURS. Application of managerial sciences to operations and control of operational systems. Emphasis on systems operations facilities, systems standards and information flow, system maintenance, and the behavioral interface and system control. Prerequisite: Mgmt. 355 or the equivalent.

357. OPERATIONS AND SYSTEMS MANAGEMENT III. 4 HOURS. Emerging concepts in management science. Managerial applications of computer technology

and utilization and related electronic data processing. Application of quantitative methods to information and control methods and systems. Process and systems design. Prerequisite: Mgmt. 356.

358. MANAGERIAL LOGISTICS. 4 HOURS. The management of all activities governing the physical flow of raw materials and finished goods through stages of production to points of final consumption. Key areas considered include design of logistics systems, location theory, inventory control, and the use of mathematical techniques in solving problems of logistics managment. A logistics system computer simulation game is used. Prerequisites: Mgmt. 351 and Econ. 321.

359. BUSINESS POLICY. 4 HOURS. A capstone course that provides an understanding of the direction of business operations from the top-managment point of view rather than from the limited view of a particular functional-area specialist. By means of class discussion, written analysis of cases, and development of feasible plans of action, the students gain experience in determining problem areas in company planning and management and in dealing successfully with a constantly changing business environment. Prerequisite: Completion of core requirements of the College of Business Administration.

360. BUSINESS, SOCIETY, AND TECHNOLOGY. 4 HOURS. Business and the corporate role in a complex, technological society. Emphasis on the historical evolution of business; the many relationships of the corporation to its external environment; urban problems of business; the impact of the corporation on individual and group behavior. Prerequisites: Senior standing, Econ. 322 or 323, and Mgmt. 351.

363. COLLECTIVE BARGAINING. 4 HOURS. Intensive examination of the structure and conduct of collective bargaining: the determination of the bargaining unit and bargaining representative; the negotiation and scope of contracts; the administration of contracts; the major substantive issues in negotiations; the procedures for resolving industrial conflict. Prerequisites: Mgmt. 353 and 354.

364. LABOR LAW AND NATIONAL LABOR POLICY. 4 HOURS. The evolution of national labor policy considered within a framework of labor legislation, court decisions, and administrative rules. Problems of effectuating labor agreements; problems of protecting individual employee rights in a collective bargaining context. Introduction to the legal and constitutional problems of government regulation of industrial and labor relations. Prerequisite: Mgmt. 354 or consent of the instructor.

366. TECHNOLOGICAL FORECASTING. 4 HOURS. The methodology of forecasting the impact of technological change on the managerial process; emphasis on selection of goals and parameters, revelance of figures of merit and various forecasting methodologies. Prerequisite: Mgmt. 355 or the equivalent.

367. IMPACT OF TECHNOLOGICAL CHANGE. 4 HOURS. The impact of technological change on the business environment and the managerial process; emphasis on alternative futures and planning to attain desired ends. Prerequisite: Mgmt. 366.

373. COLLECTIVE BARGAINING IN PUBLIC EMPLOYMENT. 4 HOURS. Practices and legislation pertaining to union-management relations at the federal, state, and local levels of government. Procedural and policy issues confronting public employees, union officials, and government administrators. Prerequisite: Mgmt. 354 or consent of the instructor.

374. COMPARATIVE INDUSTRIAL RELATIONS SYSTEMS. 4 HOURS. Analysis of industrial relations structures, problems, and experiences among selected countries. Common and contrasting features of industrial relations systems are related to national economic, political, and social characteristics. Examination of the implication for management and economic development of differences among industrial relations systems. Prerequisite: Mgmt. 354.

399. INDEPENDENT STUDY. 2 TO 4 HOURS. May be repeated once for credit. Students in the College of Business Administration may register for this course to pursue advanced independent study in approved topics related to management. Written report prepared under the guidance of a major professor is required. Prerequisites: 16 hours of upper-division management courses and consent of the department head.

MARKETING (Mktg)

360. PRINCIPLES OF MARKETING. 4 HOURS. Required of all students in the College of Business Administration. The workings of the marketing system and the way in which marketing decisions are made.

361. CONSUMER MARKET BEHAVIOR. 4 HOURS. Motivations underlying market behavior of consumers, producers, middlemen; drives, emotions, desires, learning, memory; effects of demographic characteristics, social status, and reference groups on marketing action. Prerequisite: Mktg. 360 or consent of the instructor.

362. MARKETING RESEARCH AND INFORMATION SYSTEMS. 4 HOURS. Investigation of the gathering and interpretation of information used in solving marketing problems; pertinent modern research techniques from mathematics and the behavioral sciences are employed in developing an analytical structure. Prerequisites: Mktg. 361 and QM 272 or the equivalents.

363. MARKETING ORGANIZATION. 4 HOURS. Principles underlying the development of an integrated distribution system; its relationship to the marketing structure of the firm; evaluation of decisions on raw-material sources, plant and warehouse location, wholesale and retail outlets; analysis of the movement of products through marketing channels. Prerequisite: Mktg. 360.

364. MANAGING MARKETING COMMUNICATIONS. 4 HOURS. Analysis of communication information among producers, middlemen, and consumers for marketing purposes; managerial problems in directing a firm's promotional efforts; personal selling, advertising, sales promotion, public relations. Prerequisite: Mktg. 360.

365. MARKETING MANAGEMENT. 4 HOURS. Seminar. Building marketing programs to implement the achievement of marketing objectives. Individual and group research and presentation from the viewpoint of major marketing executives of the firm; business case analysis. Prerequisite: 20 hours of marketing.

366. COMPARATIVE MARKETING SYSTEMS. 4 HOURS. An advanced course that treats domestic marketing systems and their structures and processes in a framework of comparative cultural, political, economic, and social systems. Prerequisite: Mktg. 360.

390. SPECIAL TOPICS IN MARKETING 4 HOURS. Intensive study of selected problems. Reading assignments are drawn from scholarly and professional journals; emphasis on covering relatively few areas in great depth.

MATERIALS ENGINEERING (MatE)

200. STATICS AND DYNAMICS. 4 HOURS. Statics of particles and rigid bodies; kinematics and dynamics of particles. Work and law of kinetic energy, law of impulse-momentum. Prerequisites: Math. 132 and Phys. 131.

201. INTRODUCTION TO SOLID MECHANICS. 3 HOURS. Analysis of stress and strain, principal stresses and strains. Constitutive laws of elastic and selected types of inelastic materials. Strain energy and failure criteria. Simple problems of stress and deformation analysis. Prerequisites: MatE. 200 and Math. 133.

202. MATERIALS AND MECHANICS LABORATORY. 2 HOURS. Introduction to experimental techniques; particular reference to material behavior. Prerequisites: MatE. 201 and 230.

203. COMPOSITIONS AND PROPERTIES OF CONCRETE. 4 HOURS. Properties and types of cements and aggregates, hydration, mix design strength, deformation and durability of hardened concrete. 3 hours, lecture; 2 hours, laboratory. Prerequisites: MatE. 201 and 230.

204. MECHANICS OF SOLIDS I. 4 HOURS. Elementary solutions describing the behavior of an elastic body. Engineering approximations: bending, torsion, and buckling. Prerequisites: MatE. 201, Math. 133.

205. MECHANICS OF SOLIDS II. 4 HOURS. Introduction to structural energy principles: virtual work, potential energy, complementary energy, reciprocity. Application to beams, frames, trusses, beam columns, and the like. Prerequisite: MatE. 204.

206. MECHANICS OF SOLIDS III. 4 HOURS. Plane problems of elasticity and simple solutions in Cartesian and polar coordinates. Engineering approximations: thin-walled pressure vessels, torsion of thin-walled sections, curved beams. Extension to inelastic materials. Prerequisite: MatE. 204.

207. STRUCTURAL ANALYSIS I. 4 HOURS. Analysis of statically determinate and indeterminate structures. Slope-deflection and moment distribution methods. Approximate analysis of frames. Frame stability. Special structures. Term project. Field trip. Prerequisite: MatE. 205.

208. MECHANICAL VIBRATIONS. 4 HOURS. Free and forced vibrations of damped and undamped linear single and multiple degree-of-freedom systems. Introduction to nonlinear system vibration. Approximate methods, instrumentation, and applications. Prerequisites: MatE. 102, Math. 220 or the equivalents.

209. ANALYSIS AND SYNTHESIS OF MECHANISMS I. 4 HOURS. Analytical and graphical analysis of plane and spatial motion. Geometrical and algebraic synthesis of mechanisms. Computer methods, applications. Prerequisite: MatE. 211.

211. DYNAMICS OF RIGID BODIES. 4 HOURS. A first course. Angular velocity and acceleration, coriolis, transport and relative acceleration, moments and products of inertia, Newton's second law, Euler's equations, impulse and momentum. Prerequisite: MatE. 200.

221. BEHAVIOR AND DESIGN OF METAL STRUCTURES. 3 HOURS. Design of metal structures; behavior of members and their connections; theoretical, experimental, and practical bases for proportioning members. Prerequisite: MatE. 205.

225. DESIGN OF CONCRETE STRUCTURES. 4 HOURS. Analysis and design of concrete structural elements: beams, columns, slabs, and the like. Prestressed concrete design. Prerequisite MatE. 203.

230. PROPERTIES OF MATERIALS. 4 HOURS. Introduction to the relationships among composition, structural, physical, and mechanical properties of metals, ceramics, and polymers. Correlation with manufacturing processes, service performance, and materials selection. Prerequisites: Chem. 113, Math. 132, and Phys. 131.

239. X-RAY METALLOGRAPHY I. 3 HOURS. Part I of a two-course sequence. X-ray generation and scattering. Applications of methods of X-ray diffraction to studies of crystallography and problems in physical metallurgy, such as phase identification, lattice parameter determination, grain size determination, preferred orientation, surface topography and residual stress determination. Prerequisite: MatE. 230.

241. EXPERIMENTAL METHODS IN SOLID AND FLUID MECHANICS. 4 HOURS. Same as Energy Engineering 241. Introduction to the theory and practice of experimental methods, measurement techniques in solids and fluids, analysis of errors. Concurrent laboratory experiments and reports. Prerequisites: EnrE. 211, MatE. 102 and 103.

243. METALLURGICAL PROBLEMS. 5 HOURS. Theory and application of the laws of thermodynamics to metallic systems; problems concerning industrial and metallurgical processes. Prerequisites: EnrE. 201 and Chemistry Common Core sequence.

244. MATERIALS PROCESSING II. 4 HOURS. Principles and practices of casting and joining processes. Solidification of metals. Properties of mold materials. Diffusion bonding, brazing, and soldering. Prerequisite: MatE. 230.

245. MATERIALS PROCESSING LABORATORY II. 1 HOUR. Experimental melting, casting, mold preparation, analysis of defects in sand, permanent mold, investment and shell castings, mold control, pattern design. Prerequisite: Credit or registration in MatE. 244.

246. NUMERICAL CONTROL PROCESSING. 4 HOURS. Principles and application of numerical control as applied to numerous industrial processes. Application of servo systems used in numerical control. Design and use of computer programming for control of machines and processes. Prerequisite: Math. 195.

248. MATERIALS PROCESSING I. 4 HOURS. Principles and practices of heat treating and surface treating of materials. Introduction to equipment and processes used in heat treating of steels and common nonferrous alloys and to carburizing, nitriding, and other surface treatments. Prerequisites: EnrE. 201, 211, and MatE. 230.

249. MATERIALS REMOVAL PROCESSING. 4 HOURS. Laboratory and classroom study of manufacturing processes where metals or other materials are removed. Effects of the process upon the finished product, the tooling, and the machine. Mechanics of metal cutting. Computer applications. Prerequisite: MatE. 230.

250. PHYSICAL METALLURGY I. 3 HOURS. Part I of a three-course sequence. Principles and interpretation of phase diagrams; relationships between structure, thermal history, and properties. Prerequisite: MatE. 230.

251. PHYSICAL METALLURGY II. 3 HOURS. Part II of a three-course sequence. Fundamental treatment of mechanical properties. Elastic behavior. Plastic behavior of single crystals. Elements of dislocation theory. Plastic behavior of polycrystalline aggregates. Fracture. Prerequisite: MatE. 250.

252. PHYSICAL METALLURGY III. 3 HOURS. Part III of a three-course sequence. Diffusion, nucleation, and growth in freezing and solid state transformations. Recovery and recrystallization. Physical metallurgy of cast irons and alloy steels. Prerequisite: MatE. 251.

253. PHYSICAL METALLURGY LABORATORY I. 1 HOUR. Part I of a three-course sequence. Principles and applications of tools and experimental procedures for metallurgical laboratory activity. Report writing is emphasized. Topics include solidification, heat treatment, mechanical and physical properites, metallography and photomicrography, analysis of microstructures and relationship to properties, cold work, and annealing. Prerequisite Registration in MatE. 250.

254. PHYSICAL METALLURGY LABORATORY II. 1 HOUR. Part II of a three-course sequence. Principles and applications of tools and experimental procedures for metallurgical laboratory activity. Report writing is emphasized. Topics include solidification, heat treatment, mechanical and physical properties, metallography and photomicrography, analysis of microstructures and relationship to properties, cold work, and annealing. Prerequisite: Registration in MatE. 251.

255. PHYSICAL METALLURGY LABORATORY III. 1 HOUR. Part III of a three-course sequence. Principles and applications of tools and experimental procedures for metallurgical laboratory activity. Report writing is emphasized. Topics include solidification, heat treatment, mechanical and physical properties, metallography and photomicrography, analysis of microstructures and relationship to properties, cold work, and annealing. Prerequisite: MatE. 230.

260. SOIL BEHAVIOR. 4 HOURS. Origin of soil deposits and mineral composition of soils. Soil classification. Soil compaction. Soil as a three-phase system: effective and neutral stresses, effective stress principle. Soil water: permeability, capillarity, frost heaving. Consolidation. Lectures and laboratory. Prerequisite: MatE. 202.

261. FOUNDATION ENGINEERING. 4 HOURS. The effect of subsurface soil conditions on choice of foundation. Subsurface soil exploration. Type of foundations: spread footings; mat; pile foundations. Proportioning foundations for settlement and bearing capacity. Earth pressures. Design of rigid retaining structures: retaining walls; bracing of excavations. Prerequisite: MatE. 260.

272. MEASUREMENT RELIABILITY IN MANUFACTURING. 4 HOURS. Laboratory approach to the use of measuring instruments and equipment. Use of computer methods for reliability, prediction, and quality assurance. Quality control implications relating to measurement practice. Prerequisite: MatE. 246 or consent of the instructor.

282. DESIGN OF MACHINE ELEMENTS. 4 HOURS. Application of established methods of mechanics to the design of machine elements. Energy methods, curved beams, rotating disks, combined loading of shafts, springs, contact stresses. Prerequisites: Senior standing, MatE. 204 and 230.

289. COOPERATIVE ENGINEERING PRACTICE. 0 HOURS. Same as Energy Engineering 289, Information Engineering 289, and Systems Engineering 289.

Off-campus participation in a government or industrial training program. Prerequisite: Enrollment in the cooperative engineering program.

290. COOPERATIVE ENGINEERING SEMINAR. 1 HOUR. Same as Energy Engineering 290, Information Engineering 290, and Systems Engineering 290. Lectures and seminar for students in the cooperative engineering program. Prerequisite MatE. 289, taken during the previous quarter.

291. UNDERGRADUATE SEMINAR. 1 TO 3 HOURS. Students conduct an in-depth study of areas of materials engineering of special interest to them. Oral and written reports are required. Prerequisite: Senior standing.

292. UNDERGRADUATE RESEARCH. 2 TO 4 HOURS. Research under the close supervision of a faculty member. Prerequisite: Consent of the instructor.

302. APPLIED ELASTICITY I. 4 HOURS. Variational theorems of elasticity theory. Application to establishment and solution of approximate systems: beams (including shear deformations) and plates. Introduction to instability theory. Prerequisite: MatE. 205 or 206.

303. THEORY OF ELASTICITY I. 4 HOURS. The boundary value problems of linear isotropic elasticity theory. Uniqueness of solution. Reduction to two dimensions: the plane problem, torsion, bending. General orthogonal coordinates and special application to polar coordinates. Three-dimensional problems with axial symmetry. Prerequisite: MatE. 316.

304. EXPERIMENTAL STRESS ANALYSIS. 4 HOURS. Structural similitude and dimensional analysis. Brittle coating. Introduction to photoelasticity. Strain measurement techniques. Prerequisite: MatE. 206.

308. INTERMEDIATE VIBRATION THEORY. 4 HOURS. Analytical and numerical treatment of vibrations induced in n-degree of freedom linear, discrete systems by periodic, shock, and random excitation. Prerequisite: MatE. 208.

309. ANALYSIS AND SYNTHESIS OF MECHANISMS II. 4 HOURS. Advanced techniques for the analysis and synthesis of motion. Emphasis on planar mechanisms. Roberts-Chebyschev theorem, Euler-Savary equation. Type, number, and dimensional synthesis. Geometric and algebraic techniques. Applications, computational methods. Prerequisite: MatE. 209.

311. INTERMEDIATE DYNAMICS. 4 HOURS. Kinematics of a point, space curves. Particle dynamics, orbital motion and stability. Moving reference frames. Rigid body dynamics: the inertia tensor, Euler's equations, application to gyroscopic motion. Hamilton's principle. Generalized coordinates. Lagrange's equations. Prerequisites: MatE. 102, Math. 220 or consent of the instructor.

312. NONLINEAR OSCILLATIONS. 4 HOURS. Exact and approximate methods of studying vibrations of nonlinear systems. Analytical and graphical techniques. Forced oscillations, self-excited systems, stability criteria. Computer methods. Practical applications. Prerequisite: MatE. 208.

313. APPLIED DYNAMICS. 4 HOURS. Analytical methods in the study of dynamic forces in machines. Application of the methods to linkages, cam systems, balancing, and critical speeds. Prerequisites: MatE. 209 and 311.

316. INTRODUCTION TO CONTINUUM MECHANICS. 4 HOURS. Same as Energy Engineering 316. Cartesian tensors, kinematics of fluids and solids, conservation equations, constitutive equations for simple materials. Examples. Prerequisites: EnrE. 211 or MatE. 204, Math. 220.

321. STRUCTURAL ANALYSIS II. 4 HOURS. Establishment of basic equations governing linear structural systems. Matrix inversion and relaxation solutions. Approximate analyses. Introduction to dynamics of structures. Prerequisite: MatE. 207.

322. CONCRETE TECHNOLOGY. 4 HOURS. Relations between microstructure and macroproperties, mechanism of fracture, shrinkage and creep, new types of concrete, effects of environment and mixtures. Individual research project involving laboratory and analytic techniques. 3 hours, lecture; 2 hours, laboratory. Prerequisite: MatE. 203 or the equivalent.

324. LIMIT ANALYSIS AND DESIGN OF STRUCTURES. 4 HOURS. Boundedness principles of perfect plasticity. Application to analysis and design of structures. Prerequisite: MatE. 207.

325. CONCRETE DESIGN OF SHELL AND PLATE STRUCTURES. 4 HOURS. Derivation of membrane and bending theories for shells of revolution, folded plates, and shells of single and double curvature. Application to barrel roofs, domes, and storage tanks. Prerequisites: Math. 220 and MatE. 225 or 302 or consent of the instructor.

326. DESIGN IN PRESTRESSED AND PRECAST CONCRETE. 4 HOURS. Behavior and design of prestressed and precast concrete structures. Prestressing systems; problems of shrinkage, creep, and anchorage. Design of beams, slabs, containment vessels, and piles. Design of precast concrete building systems. Prerequisite: MatE. 225 or consent of the instructor.

331. ELECTRON THEORY OF METALS. 3 HOURS. Modern physical concepts of metals and alloys. Introduction to wave mechanics. Thermal, electrical, and magnetic properties of metals. Band theory of metals. Prerequisite: MatE. 252.

332. ADVANCED DIFFRACTION ANALYSIS. 3 HOURS. Single crystal methods in X-ray diffraction, orientation determination, pole figures, structure determination, precision lattice constant methods. Prerequisite: MatE. 239 or the equivalent.

333. DESIGN USE OF MATERIALS. 4 HOURS. Extreme value statistics. Mechanical effects of a notch. Fracture mechanics. Fatigue. Stress rupture. Residual stress effects. Relationships to designed performance. Prerequisite: MatE. 230.

334. METALLURGY OF NUCLEAR MATERIALS. 3 HOURS. Basic principles of nuclear reactors, fission, moderation, poisoning, radioactivity. Selection of materials for fuels, cladding, moderators, coolants, and shields with regard to a reactor environment. Radiation effects, heat transfer, environmental problems, reactor safety, and neutron conservation. Prerequisites: Phys. 232 or the equivalent; MatE. 252.

335. ELECTRON MICROSCOPY. 3 HOURS. The electron microscope and its application to the study of surface replicas and thin films of metals, alloys, and other materials. Sources of contrast. Selected area diffraction. Prerequisites: MatE. 239 and 252.

337. PROCESS METALLURGY OF IRON AND STEELMAKING. 4 HOURS. Physicochemical principles applied to reduction, conversion, and refining of steel and ferrous alloys. Applications of thermodynamics to equilibrium problems, such as slag-metal equilibria, and applications of process engineering principles to the dynamic behavior of various component systems, such as sinter plants, blast furnaces, and basic oxygen furnaces. Prerequisite: MatE. 243 or consent of the instructor.

338. PARTICULATE SOLIDS PROCESSING. 4 HOURS. Characterization of particulate solids by size and shape. Size classification and reduction. Wet and dry fluid-solid and solid-solid separation processes. Transportation and agglomeration of particulate solids. Lecture and laboratory. Prerequisites: EnrE. 211, MatE. 200 and 230.

339. ELECTRONIC MATERIALS PROCESSING. 4 HOURS. Materials processing methods germane to materials for electronics applications, including magnetic, dielectric, and strain-sensitive materials; semiconductor materials. Prerequisite: MatE. 230.

344. PHYSICAL-CHEMICAL PRINCIPLES OF SOIL BEHAVIOR I. 4 HOURS. Clay mineralogy, soil formation and composition, sedimentation, mineral identification, colloidal phenomena in soils. Prerequisite: MatE. 260.

345. PHYSICAL-CHEMICAL PRINCIPLES OF SOIL BEHAVIOR II. 4 HOURS. Swelling, ion association, soil-water analysis of mechanical behavior of soils in terms of physiochemical principles conduction phenomena. Prerequisite: MatE. 344.

346. PHYSICAL-CHEMICAL PRINCIPLES OF SOIL BEHAVIOR III. 4 HOURS. Deformation mechanisms and strength, compaction, frost action, rate processes, such as secondary compression, creep, thixotropy. Prerequisite: MatE. 345.

360. DEFORMATION PROCESSING. 4 HOURS. Principles of deformation processes. Basic methods of problem solving. Practices and process control. Relations between processing and finished properties. Prerequisites: MatE. 201 and 230.

361. DEFORMATION PROCESSING LABORATORY. 2 HOURS. Measurement and analysis of forces in forging, rolling, drawing and deep drawing. Effects of material properties, process variables, and friction conditions. Prerequisites: MatE. 202 and 360.

362. POWDER METALLURGY. 3 HOURS. Physical attributes of fine powders. Mechanics of pressing. Theories of solid state sintering. Liquid phase sintering. Manufacturing aspects. Prerequisite: MatE. 230 or consent of the instructor.

363. ADVANCED PHASE DIAGRAMS. 4 HOURS. Ternary phase equilibria in metal systems. Vertical and horizontal sections, methods of construction and interpretation. Examination of quaternary and more complex systems. Application of thermodynamic principles to construction. Prerequisite: MatE 250.

364. POLYMER PROPERTIES AND TECHNOLOGY. 4 HOURS. Polymer structure and properties. Characterization of polymeric materials. Polymer processing and manufacturing technology. Prerequisite: MatE. 230.

367. CERAMICS TECHNOLOGY. 4 HOURS. An introductory course in ceramics for engineers. Ceramics as materials of technological importance are examined from the science, engineering, and manufacturing viewpoints. Crystalline and noncrystalline (glass) materials are covered. Special emphasis on applications in industry. Prerequisite: MatE. 230.

368. SOLIDIFICATION THEORY AND PRACTICE. 3 HOURS. Theory of solidification and its applications to problems in casting and refining of crystalline materials. Prerequisites: MatE. 244, 248.

370. SOIL MECHANICS I. 4 HOURS. The nature of soils and soil deposits; stresses in soil masses; granular materials; stress-strain behavior and shear strength, earth pressures on retaining structures, bearing capacity and settlements of shallow foundations. Two laboratory exercises in stresses and settlements of shallow foundations. Prerequisite: MatE. 260.

371. SOIL MECHANICS II. 4 HOURS. Concept of effective stress; seepage and pore pressures; stress-strain behavior and shear strength of drained cohesive materials; earth retaining structures; slope stability. One laboratory exercise in the principle of effective stress. Prerequisite: MatE. 370.

372. SOIL MECHANICS III. 4 HOURS. Consolidation theory; stress-strain behavior and shear strength of undrained cohesive materials; soil-structure interaction; formulation and computer solution of field problems. Prerequisites: MatE. 371, Math. 195 or programming experience.

373. LABORATORY DETERMINATION OF SHEAR STRENGTH OF SOILS 2 HOURS. Approximately 4 hours per week of laboratory-lecture. Prerequisite: Credit or concurrent registration in MatE. 372.

381. NOISE AND VIBRATION CONTROL. 4 HOURS. Nature of sound as it relates to the control of vibration and wave propagation. Design procedure based on hearing, acoustical environment, acoustical materials, and soil dynamics. Legal and medical problems. Prerequisite: MatE. 208 or the equivalent.

383. DESIGN OF FILM BEARINGS. 4 HOURS. Application of mechanics to the design of film bearings. Journal bearings. Thrust bearings. Slider bearings. Cavitation cooling requirements. Materials and manufacturing considerations. Prerequisites: EnrE. 211, Math. 220.

384. DESIGN IN MATERIAL PROCESSES. 3 HOURS. Design and optimization of chemical and mechanical metallurgical processing systems. Process modeling and analysis. Direct search linear and dynamic programming solutions of process problems. Economic analysis and investment strategy. Prerequisite: MatE. 243 or 244 or EnrE. 234.

391. SEMINAR. 1 HOUR. Topics to be arranged. Prerequisite: Consent of the instructor.

393. SPECIAL PROBLEMS. 2 TO 4 HOURS. Special problems or reading by special arrangement with the faculty. Prerequisite Consent of the instructor.

396. SENIOR DESIGN I. 4 HOURS. Same as Energy Engineering 396, Information Engineering 396, and Systems Engineering 396. Introduction to engineering economics, legal and social constraints on design, safety and reliability theory, and the use of simulation and optimization techniques in the engineering design process. Prerequisite: Senior standing in the College of Engineering.

397. SENIOR DESIGN II. 4 HOURS. Same as Energy Engineering 397, Information Engineering 397, and Systems Engineering 397. Application of principles of engineering and engineering design methodology to the solution of a large-scale design problem. May be taken in any department, regardless of area of concentration. Prerequisite: MatE. 396.

MATHEMATICS

100. ALGEBRA I. 5 HOURS. Credit is not given for Mathematics 100 if the student has credit in Mathematics 101, 104, 112, 130, 171, or 172 or the equivalent. No graduation credit for architecture, business administration, or engineering students. Fundamentals of algebra, factoring, fractions, radicals, exponents, solution of linear, simultaneous, and quadratic equations, functions, graphing. Prerequisites: 1 unit of entrance credit in algebra and 1 unit in plane geometry.

101. ALGEBRA II. 5 HOURS. Credit is not given for Mathematics 101 if the student has credit in Mathematics 104, 112, 130, or 172 or the equivalent. No graduation credit for architecture, business administration, or engineering students. Complex numbers, logarithms, progressions, mathematical induction, binomial theorem, inequalities, theory of equations, determinants. Prerequisite: Math. 100.

104. COLLEGE ALGEBRA. 5 HOURS. Credit is not given for Mathematics 104 if the student has credit in Mathematics 100, 101, 112, or 131 or the equivalent. No graduation credit for architecture, business administration, or engineering students. Theory of equations, determinants, complex numbers, permutations and combinations, mathematical induction, binomial theorem, progressions, inequalities, logarithms. Prerequisites: 1½ units of entrance credit in algebra and 1 unit in plane geometry and/or Math. 172.

105. TRIGONOMETRY. 3 HOURS. No graduation credit for architecture, business administration, or engineering students. Restricted to students who have not had a formal course in trigonometry. Identities, equations, addition formulas and derived relations, solution of triangles, radian measure, graphs, inverse functions. Prerequisites: 1½ units of entrance credit in algebra and 1 unit in plane geometry and/or Math. 101 or 104 or 172.

106. MATHEMATICS FOR ELEMENTARY TEACHERS I. 4 HOURS. Designed to prepare students to teach contemporary mathematics programs in the elementary schools. Prerequisites: Enrollment in the College of Education.

107. MATHEMATICS FOR ELEMENTARY TEACHERS II. 4 HOURS. Prerequisite: Math. 106.

108. MATHEMATICS FOR ELEMENTARY TEACHERS III. 4 HOURS. Prerequisite: Math. 107.

110. FINITE MATHEMATICS. 5 HOURS. Statements and logic, sets, Boolean algebra, probability, vectors and matrices, linear programming, theory of games. Prerequisites: Math. 101 or 104 or the equivalent.

111. INTRODUCTION TO ANALYSIS I. 3 HOURS. For students in the College of Business Administration; others, by approval of the department. Introduction to differential and integral calculus, together with sufficient material from analytic geometry to assist in the development and application of the calculus. Prerequisite: Math. 101 or 104 or the equivalent.

112. INTRODUCTION TO ANALYSIS II. 3 HOURS. For students in the College of Business Administration; others, by approval of the department. Continues Mathematics 111. Prerequisite: Math. 111.

115. FUNDAMENTALS OF MATHEMATICS I. 4 HOURS. Survey course in mathematics: numbers and numerals, algebra, progressions, number theory. Prerequisites: 1 unit of entrance credit in algebra and 1 unit in plane geometry.

116. FUNDAMENTALS OF MATHEMATICS II. 4 HOURS. Survey course in mathematics: axioms of euclidean geometry, symmetry, perspective, Cartesian geometry, conic sections, noneuclidean geometry. Prerequisite: Math. 115 or consent of the instructor.

117. FUNDAMENTALS OF MATHEMATICS III. 4 HOURS. Survey course in mathematics: sets and logic, infinity, probability, statistics, calculus, computing machines. Prerequisite: Math. 116.

130. CALCULUS AND ANALYTIC GEOMETRY I. 5 HOURS. Elementary analytic geometry. Introduction to differential and integral calculus and applications. Prerequisites: Math. 101 and 105 or 104 and 105 or the equivalents.

131. CALCULUS AND ANALYTIC GEOMETRY II. 5 HOURS. The Riemann integral. Trigonometric and logarithmic functions. Integration in elementary terms. Polar coordinates and parametric equations. Prerequisite: Math. 130.

132. CALCULUS AND ANALYTIC GEOMETRY III. 5 HOURS. Techniques of integration, numerical integration and inequalities for integrals, vectors and applications. Prerequisite: Math. 131.

133. CALCULUS AND ANALYTIC GEOMETRY IV. 5 HOURS. Functions of several variables, partial derivatives, multiple integrals, infinite series and power series, improper integrals. Prerequisite: Math. 132.

170. INTRODUCTION TO COLLEGE MATHEMATICS I. 5 HOURS. Arithmetic and algebra of signed numbers, single and simultaneous equations, properties of number systems, including estimation via the greatest integer function. Points, lines, segments, rays, and angles on a line and in a coordinate plane. Prerequisite: Approval of the department.

171. INTRODUCTION TO COLLEGE MATHEMATICS II. 5 HOURS. Mathematical relations; mathematical relations compared to functions; elementary set theory; set theory and numbers; the absolute value function; three-dimensional graphs; lattices; varycentric coordinance. Prerequisites: Math. 170 and approval of the department.

172. INTRODUCTION TO COLLEGE MATHEMATICS III. 5 HOURS. Systems of quadratic equations, logarithmic and exponential functions, determinants, sequences and progressions, trigonometric functions, identities, inverse trigonometric functions, graphs, law of sines and cosines. Prerequisite: Math. 171.

194. INTRODUCTION TO AUTOMATIC DIGITAL COMPUTING FOR NONTECHNICAL STUDENTS. 3 HOURS. Credit is not given for both Mathematics 194 and 195; either serves as the prerequisite for more advanced programming courses. Programming a modern digital computer in a user-oriented

language. Mathematics 194 is for students in curricula that do not require calculus; assigned problems assume only high school mathematics.

195. INTRODUCTION TO AUTOMATIC DIGITAL COMPUTING. 3 HOURS. Credit is not given for both Mathematics 194 and 195; either serves as the prerequisite for more advanced programming courses. Programming a modern digital computer in a user-oriented language. Mathematics 195 is for students in curricula that require calculus; assigned problems assume the student is familiar with elementary calculus. Prerequisite: Math. 132.

198. SPECIAL TOPICS IN MATHEMATICS. 1 TO 4 HOURS. May be repeated for credit. Course content will be announced prior to each quarter in which it is given. Prerequisite: Consent of the instructor.

210. IDEAS IN MATHEMATICS. 4 HOURS. Historical and intellectual aspects of some of the key ideas of pure and applied mathematics; interplay between the development of concepts in pure and applied mathematics. Prerequisites: Superior standing and consent of the instructor.

220. ELEMENTARY DIFFERENTIAL EQUATIONS I. 3 HOURS. Systematic procedures for solving ordinary differential equations with emphasis on initial value problems of second order linear equations. Series solutions near ordinary and singular points. Introduction to the Laplace transforms and numerical methods. Prerequisite: Math. 133.

250. STATISTICS FOR ENGINEERS. 5 HOURS. A first course in the use of statistical methods for interpreting the results of experiments. Probability and distributions, expectation, sampling and testing, estimation problems, chi square test, T and F tests, regression and correlation. Prerequisite: Math. 133.

280. PROBLEM-ORIENTED LANGUAGES. 3 HOURS. Study of several problem-oriented machine languages, such as ALGOL, PL/1, SNOBOL. Programming exercises using these languages. Prerequisite: Math. 194 or 195.

281. ASSEMBLY LANGUAGE PROGRAMMING. 3 HOURS. The logical organization of modern digital computers. Assembly language programming for such a machine. Prerequisite: Math. 194 or 195.

290. INTRODUCTION TO THE THEORY OF DIGITAL MACHINES. 3 HOURS. The general organization of computers, number systems, Boolean algebra, design of combinational circuits, and sequencing of arithmetic operations. Prerequisite: Math. 195.

298. SPECIAL TOPICS IN MATHEMATICS. 1 TO 4 HOURS. May be repeated for credit. Course content will be announced prior to each quarter in which it is given. Prerequisite: Consent of the instructor.

300. TEACHERS COURSE I. 3 HOURS. Graduate credit for this course is restricted. See the Graduate College catalog. Important concepts and the problems involved in the teaching theory; treatment of numeration systems, set relations, functions, whole numbers, logic, and proof; examination of some of the major new curricula. Prerequisite: Math. 133 or consent of the instructor.

301. TEACHERS COURSE II. 3 HOURS. Graduate credit for this course is restricted. See the Graduate College catalog. Continues Mathematics 300. Topics, discussed from an advanced viewpoint, include mathematical induction, the completeness

axiom composition of functions, sequences, a vector approach to geometry, axioms of the Hilbert type. Prerequisite: Math. 300 or consent of the instructor.

302. TEACHERS COURSE III. 3 HOURS. Graduate credit for this course is restricted. See the Graduate College catalog. Continues Mathematics 301. Topics, discussed from an advanced viewpoint, include arithmetic and geometric progressions, continued sums and products, difference sequences, pigeon-hole principle, limits, continuity, exponential functions, logarithmic functions, circular functions, combinations and permutations. Prerequisite: Math. 301 or consent of the instructor.

303. ADVANCED EUCLIDEAN GEOMETRY I. 3 HOURS. Graduate credit for this course is restricted. See the Graduate College catalog. Geometry from Euclid to the present, equivalents of Euclid's fifth postulate, noneuclidean geometries, finite and projective geometries, invariants of configurations under transformation. Prerequisite: Math. 133.

304. ADVANCED EUCLIDEAN GEOMETRY II. 3 HOURS. Graduate credit for this course is restricted. See the Graduate College catalog. The parallel postulate, similarity, area, perpendicularity, circles and spheres, constructions with ruler and compass. Prerequisite: Math. 303.

305. ADVANCED EUCLIDEAN GEOMETRY III. 3 HOURS. Graduate credit for this course is restricted. See the Graduate College catalog. Ruler and compass constructions, proportionality, length and area, solid mensuration, hyperbolic geometry. Prerequisite: Math. 304.

307. THEORY OF SETS AND THE REAL NUMBER SYSTEM. 5 HOURS. Elementary set theory and the development of the integers, the rational numbers, and the real numbers. Prerequisite: Math. 133.

309. TOPICS IN THE TEACHING OF MATHEMATICS. 3 HOURS. May be repeated for credit. No more than 8 hours may be used toward the Master of Science in the Teaching of Mathematics. Seminars, conferences, or sections on special topics and advanced problems for students majoring in mathematics education and for in-service teachers who wish to study new-curriculum development and special problems in teaching mathematics. Prerequisite: Math. 302 or consent of the instructor.

310. ADVANCED CALCULUS I. 4 HOURS. Differential and integral calculus of vector fields, vector functions, partial differentiation, transformations, improper integrals, double and triple integrals, and applications. Prerequisite: Math. 133.

311. ADVANCED CALCULUS II. 3 HOURS. Line and surface integrals, Green's theorem, Stokes' theorem, sequences, infinite series, uniform convergence. Prerequisite: Math. 310.

312. ADVANCED CALCULUS III. 3 HOURS. A set of advanced topics selected for applications in the physical sciences and engineering. Prerequisite: Math. 311.

313. ANALYSIS I. 3 HOURS. The real numbers, countable and uncountable sets, the topology of the reals, compactness, convergent and divergent sequences, Cauchy sequences, infinite series, convergence tests, rearrangements, the topology of n-space, continuous functions and their properties. Prerequisite: Math. 133.

314. ANALYSIS II. 3 HOURS. The derivative, mean value theorems, Taylor's theorem with remainder, the Riemann integral, integrability of continuous functions, the fundamental theorem of calculus, convergence of sequences and series of functions, uniform convergence, conditions for piece wise differentiability and integrability, power series. Prerequisite: Math. 313.

315. ANALYSIS III. 4 HOURS. Differentiation in n-space, partial derivatives, the derivative as a linear approximation, inverse and implicit function theorems, intergration in R^n, change of variables in integration, differential forms and integration of differential forms, Stokes' theorem. Prerequisite: Math. 314.

321. ELEMENTARY DIFFERENTIAL EQUATIONS II. 3 HOURS. Systems of linear first order differential equations. Boundary value problems for second order linear equations, and introduction to partial differential equations. Nonlinear problems described by one or two differential equations of first order. Prerequisite: Math. 220.

322. ELEMENTARY PARTIAL DIFFERENTIAL EQUATIONS I. 3 HOURS. Second order linear partial differential equations and their initial value and boundary value problems. Separations of variable and Green's formula considerations. Eigenfunction expansions for homogeneous and inhomogenous heat equation in finite domains. Sturm-Liouville problem. Fourier series. Prerequisites: Math. 310 or 313 and Math. 321.

323. ELEMENTARY PARTIAL DIFFERENTIAL EQUATIONS II. 3 HOURS. The potential equation and the wave equation in finite domains. Semi-infinite domains. Fourier integrals. Cylindrical and spherical harmonics. Fourier-Bessel and Legendre-Bessel expansions. Prerequisite: Math. 322. F, W, S, Su

324. SPECIAL FUNCTIONS IN PURE AND APPLIED MATHEMATICS I. 3 HOURS. Special functions, including gamma, beta, cylinder, hypergeometric, and Bessel functions, as they occur in pure and applied mathematics and engineering. Prerequisite: Credit or registration in Math. 321.

325. SPECIAL FUNCTIONS IN PURE AND APPLIED MATHEMATICS II. 3 HOURS. Special functions and polynomials, including orthogonal, Legendre, Hermite, Laguerre, and Jacobi polynomials, as they occur in pure and applied mathematics and engineering. Prerequisite: Math. 324.

326. SPECIAL FUNCTIONS IN PURE AND APPLIED MATHEMATICS III. 3 HOURS. Continued study of special functions, including hypergeometric and Bessel functions, generating functions, and orthogonal, Legendre, Hermite, Laguerre, and Jacobi polynomials as they occur in pure and applied mathematics. Prerequisite: Math. 325.

330. COMPLEX ANALYSIS FOR APPLICATIONS I. 3 HOURS. Credit is not given for both Mathematics 330 and 332. Complex numbers and their geometrical representation, analytic functions, elementary functions, complex integration, Taylor and Laurent series, the calculus of residues, introduction to conformal mapping. Prerequisite: Math. 310 or 313.

331. COMPLEX ANALYSIS FOR APPLICATIONS II. 3 HOURS. Branch-point integration, series and product expansions, complex integral representations of special functions (gamma, hypergeometric, Legendre, Bessel), asymptotic methods, introduction to transforms. Prerequisites: Math. 321 and 330. W, S, Su

332. COMPLEX VARIABLES I. 3 HOURS. Credit is not given for both Mathematics 332 and 330. Power series in one variable, holomorphic functions, Cauchy's integral theorem. Taylor and Laurent expansions. Prerequisite: Math. 312 or 315 or the equivalent.

333. COMPLEX VARIABLES II. 3 HOURS. Analytic functions of several complex variables, harmonic functions, convergence of sequences of holomorphic functions, infinite products, normal families, holomorphic transformations, holomorphic systems of differential equations. Prerequisite: Math. 332.

340. MODERN HIGHER ALGEBRA I. 3 HOURS. Sets and real numbers, groups, rings. Prerequisite: Math. 133.

341. MODERN HIGHER ALGEBRA II. 3 HOURS. Euclidean and polynomial rings, vector spaces, linear transformations and matrices. Prerequisite: Math. 340.

342. MODERN HIGHER ALGEBRA III. 3 HOURS. Dual spaces, inner products spaces, modules, canonical forms of matrices, quadratic forms. Prerequisite: Math. 341.

343. FORMAL LOGIC I. 4 HOURS. Same as Philosophy 343. Propositional logic, logic of quantifiers, and identity and completeness. Prerequisite: Consent of the instructor; none for mathematics majors.

344. FORMAL LOGIC II. 4 HOURS. Same as Philosophy 344. Continues Mathematics 343. Mathematical analysis of decidability and computability. Arithmetization of syntax. Incompleteness and undefinability theorems. Introduction to axiomatic set theory. Prerequisite: Math. 343.

348. LINEAR TRANSFORMATIONS AND MATRICES. 5 HOURS. Matrix algebra, determinants, inverse of matrices, rank and equivalence, linear independence, vector spaces and linear transformation, unitary and orthogonal transformations, characteristic equation of a matrix. Prerequisite: Math. 133.

350. INTRODUCTION TO HIGHER GEOMETRY I. 3 HOURS. Projective properties in the euclidean plane, extending the euclidean plane, the projective plane, axioms for the projective plane, conics, introduction to coordinates. Prerequisite: Math. 342.

351. INTRODUCTION TO HIGHER GEOMETRY II. 3 HOURS. Topics in geometry, projective planes, higher dimensional projective geometries, model as subspaces of a vector space, coordinatization. Prerequisite: Math. 350.

353. INTRODUCTION TO DIFFERENTIAL GEOMETRY. 3 HOURS. Curves, surfaces, manifolds imbedded in euclidean space, Riemannian geometry, first and second fundamental forms of imbedded surfaces. Prerequisite: Math. 312 or 315.

355. INTRODUCTION TO TOPOLOGY I. 3 HOURS. Set theory, topological spaces, metric spaces, continuous maps, connectedness, compactness, separation axioms, completely separable spaces, mappings into Hilbert spaces. Prerequisite: Math. 310 or 313.

356. INTRODUCTION TO TOPOLOGY II. 3 HOURS. Locally connected spaces, arcs and arcwise connectivity, Cantor sets, Hahn-Mazurkiewicz theorem, elements of homotopy theory. Prerequisites: Math. 340 and 355.

357. INTRODUCTION TO TOPOLOGY III. 3 HOURS. Vector spaces, polytopes, homology theory, Euler-Poincare formula, simplicial mappings, Brouwer degree and Brouwer fixed-point theorem. Prerequisite: Math. 356.

360. ELEMENTARY THEORY OF NUMBERS I. 3 HOURS. The basic concepts of the theory of numbers: divisibility, prime numbers, congruences, quadratic reciprocity law. Prerequisite: Math. 133 or approval of the department.

361. THEORY OF NUMBERS II. 3 HOURS. Functions of number theory, recurrence functions, diophantine equations, quadratic forms, Farey sequences and rational approximations. Prerequisite: Math. 360 or consent of the instructor.

362. THEORY OF NUMBERS III. 3 HOURS. Continued fractions, distribution of primes, algebraic numbers, polynomials, partitions, density of sequences of integers. Prerequisite: Math. 361 or consent of the instructor.

366. INTRODUCTION TO THE MATHEMATICAL METHODS OF THEORETICAL PHYSICS I. 4 HOURS. Same as Physics 366. The traditional mathematical methods of theoretical physics from an intuitive point of view. Applications to problem solving in electrostatics and classical and quantum mechanics. Matrices and linear transformations, Fourier analysis, the partial differential equations of physics, and Sturm-Liouville theory. Introduction to special functions frequently encountered in physics. Prerequisites: Math. 310, 321; Phys. 303, 322, 342.

367. INTRODUCTION TO THE MATHEMATICAL METHODS OF THEORETICAL PHYSICS II. 4 HOURS. Same as Physics 367. The traditional mathematical methods of theoretical physics from an intuitive point of view. Applications to problem solving in electrostatics, electrodynamics, and classical and quantum mechanics. The special functions frequently encountered in physics and their use in the solution of boundary value problems, power series solutions, Green's functions, contour integral representations, and additional uses. Prerequisite: Math. 366.

370. INTRODUCTION TO PROBABILITY AND STATISTICS. 3 HOURS. Probability models, univariate and multivariate distributions, random variables. Prerequisite: Math. 133.

371. STATISTICS I. 3 HOURS. Statistical problems and procedures, estimation, testing hypotheses, distribution theory. Prerequisite: Math. 370.

372. STATISTICS II. 3 HOURS. One-sample problems, comparison, linear models, and analysis of variance. Prerequisite: Math. 371.

375. PROBABILITY. 3 HOURS. Law of large numbers, central limit theorem recurrent events, random walks, Markov chains. Prerequisite: Math. 370.

377. FINITE DIFFERENCES I. 3 HOURS. Difference formulas, finite integration, summation of series, Bernoulli and Euler polynomials, interpolation. Prerequisite: Math. 112 or 113.

378. FINITE DIFFERENCES II. 3 HOURS. Approximate integration, beta and gamma functions, difference equations. Prerequisite: Math. 377.

381. VECTOR AND TENSOR ANALYSIS I. 3 HOURS. Algebra of vectors, vector differential calculus, differential geometry, Stokes' theorem, divergence theorem, applications to electricity, mechanics, hydrodynamics, and elasticity. Prerequisite: Math. 311 or 314.

382. VECTOR AND TENSOR ANALYSIS II. 3 HOURS. Transformation properties, covariant and contravariant tensors, differential geometry of curves and surfaces, exterior differential geometry of curves and surfaces, exterior differential calculus with emphasis on aspects of interest in science and engineering. Prerequisite: Math. 381.

385. LAPLACE TRANSFORMS. 3 HOURS. The Laplace transform and its inverse; properties of the transform; linear differential equations (ordinary and partial); linear difference equations, gamma, error, and Bessel functions, asymptotic series, nonelementary integrals, integral equations, Hankel transforms. Prerequisite: Math. 330.

387. NUMERICAL ANALYSIS I. 3 HOURS. Mathematics 387 and 388 together provide a comprehensive introduction to linear numerical analysis. Computational methods and error analysis of matrix inversion, eigenvalues and eigenvectors, and linear approximations. Prerequisites: Math. 133 and either 194 or 195.

388. NUMERICAL ANALYSIS II. 3 HOURS. Continues Mathematics 387. Prerequisite: Math. 387.

389. NUMERICAL ANALYSIS III. 3 HOURS. Numerical integration and differentiation. Quadrature in n dimensions. Numerical integration of ordinary differential equations. Prerequisite: Math. 388.

391. BOOLEAN ALGEBRA AND SWITCHING THEORY. 3 HOURS. Sets, relations, functions, equivalence relations, abstract Boolean algebra. Applications of Boolean algebra. Minimization of Boolean functions. Representation of finite Boolean algebras. Prerequisite: Math. 310 or 313 or 340.

392. INTRODUCTION TO AUTOMATA THEORY. 3 HOURS. Boolean rings and lattices as Boolean algebras. Synchronous sequential circuits. Mealy and Moore models of automata. Regular sets. Prerequisite: Math. 391.

393. AUTOMATA AND LANGUAGES. 3 HOURS. Types of automata and their events. The semigroup of an automaton. Basic decomposition theory. Introduction to formal languages. Grammars of types 0, 1, 2, 3. Properties of context-free languages. Prerequisite: Math. 392.

394. SIMULATION LANGUAGES. 3 HOURS. Digital simulation of complex systems; general purpose and special simulation languages and their useful properties, their design and implementation; a comparison and evaluation of special languages, such as GPSS II, SIMPSCRIPT, GASP, SIMPAC, DYNAMO, and SIMULATE; application of at least one of them in a term project. Prerequisites: Math. 280 and 281 or the equivalents.

395. LIST-PROCESSING LANGUAGES. 3 HOURS. List- and string-processing languages (such as IPLV, SLIP, COMIT, SNOBOL, and LISP) from the user's point of view. Applications to nonnumeric problems, such as symbolic formula manipulation, information retrieval, and pattern recognition. Prerequisites: Math. 280 and 281 or the equivalents.

396. DESIGN OF COMPILERS. 3 HOURS. Design and implementation of algebraic compilers for a modern digital computer. Prerequisite: Math. 281.

397. COMPUTER OPERATING SYSTEMS. 3 HOURS. Problems of planning and implementing an operating system for a modern digital computer so as to utilize its power to the fullest possible extent. Prerequisite: Math. 281.

398. SPECIAL TOPICS IN MATHEMATICS. 1 TO 4 HOURS. May be repeated for credit. Course content will be announced prior to each quarter in which it is given. Prerequisite: Consent of the instructor.

399. HONORS IN MATHEMATICS. 3 HOURS. May be repeated for credit. Seminars on special topics and advanced problems to permit students majoring in mathematics to do independent study under the guidance of senior members of the staff. Prerequisites: Math. 312 and 342 or consent of the instructor.

MILITARY SCIENCE (MilS)

100. 125. LEADERSHIP LABORATORY. NO CREDIT. The laboratory develops the
135. 145. cadet's leadership characteristics by practical, progressive training in
155. 165. command and drill. The numerical sequence corresponds to the cadet's
200. 225. year-and-quarter progression and accomplishments: First quarter
235. 245. freshman—Military Science 100; second quarter freshman—Military Science
255. 265. 125, sequentially. Prerequisites: Approval of the department, enrollment in appropriate nonmilitary academic courses, and full-time status.

THE BASIC COURSE—100 SERIES.

101. ORGANIZATION AND MISSION OF THE UNITED STATES ARMY R.O.T.C. 1 HOUR. Organization and function of the United States Army R.O.T.C., including its history, purpose, objectives, and military/civilian obligations as related to the defense establishment. Prerequisites: Approval of the department, enrollment in appropriate nonmilitary courses, and full-time status.

102. THE DEFENSE ESTABLISHMENT IN NATIONAL SECURITY. 1 HOUR. Continues Military Science 101. Survey of the definition, causes, and principles of war. The evolution of weapons and warfare and the organization of military units directed toward understanding their capabilities, both tactical and supporting. Prerequisite: MilS. 101 or approval of the department.

103. THE DEFENSE ESTABLISHMENT IN NATIONAL SECURITY. 1 HOUR. Continues Military Science 102. Survey of the Defense Department's organization and responsibilities and military forces under its control. Introduction to factors of national power, objectives, and policy, and the use of military assets across the spectrum of war. Prerequisite: MilS. 102 or approval of the department.

104. MAP READING. 1 HOUR. Fundamentals of military map reading; marginal information, map symbols, map orientation, and grid reference systems. Prerequisite: Approval of the department.

105. TERRAIN ANALYSIS, AERIAL PHOTOGRAPHY, AND INTRODUCTION TO TACTICS. 1 HOUR. Continues Military Science 104. Aerial photography reading and interpretation, including terrain relationship and analysis. Introduction to small unit tactics. Prerequisite: MilS. 104 or approval of the department.

106. INTRODUCTION TO TACTICS. 1 HOUR. Continues Military Science 105. Application in the employment of squad and platoon units in offensive and defensive operations. Prerequisite: MilS. 105 or approval of the department.

107. AMERICAN MILITARY HISTORY. 1 HOUR. Survey of American military history from its origin through the Mexican War. The approach is analytical, with emphasis on leadership, the principles of war, and the growth of the military in the United States. Prerequisite: Approval of the department.

108. AMERICAN MILITARY HISTORY. 1 HOUR. Continues Military Science 107. From the American Civil War to World War I. Prerequisites: MilS. 107 and approval of the department.

109. AMERICAN MILITARY HISTORY. 1 HOUR. Continues Military Science 108. From World War I to the present. Prerequisites: MilS. 108 and approval of the department.

THE ADVANCED COURSE—200 Series.

201. MILITARY TEACHING. 2 HOURS. Introduction to the principles, methods, and techniques fundamental to military instruction, including lesson planning and presentation, use of training aids, and methods of evaluation. Prerequisite: See *GENERAL PREREQUISITES,* above.

202. BRANCHES OF THE UNITED STATES ARMY. 1 HOUR. Presentation of the branches of the Army with emphasis on their assigned special missions. Designed to provide students with sufficient information to select the branch of the service in which they desire to serve.

203. THEORY AND METHODS OF LEADERSHIP. 2 HOURS. Responsibilities and techniques of leadership; case studies in the psychological, physiological, and sociological factors which affect human behavior; individual and group solution of leadership problems common to small units.

204. INTRODUCTION TO MILITARY OPERATIONS. 2 HOURS. Introduction to the study of tactical operations and the various military teams; the coordination and planning necessary between the elements of the team.

205. ADVANCED MILITARY OPERATIONS. 2 HOURS. The organization and employment of those units organic to the Army Divisions; joint Army, Air Force, and Navy operations; airmobile concepts. Prerequisite: MilS. 204.

206. WORLD CHANGE AND MILITARY IMPLICATIONS. 1 HOUR. Analysis of the elements influencing world change and the military implications associated with such change. The nature of international relations and comparison between the power of the United States and that of individual nations or groups of nations in terms of geography, economy, politics, sociology, and military factors.

207. COMMAND AND STAFF FUNCTIONS. 2 HOURS. Organization and function of the military staff. Acquisition and application of military intelligence. Introduction to logistics and maintenance procedures. Prerequisite: MilS. 205.

208. ADMINISTRATION AND MILITARY LAW. 2 HOURS. Fundamental concepts of military justice; the principles and methods of courtroom procedures and nonjudicial punishment. Fundamentals of Army administration; latest trends and developments in equipment and procedures. Prerequisite: MilS. 207.

209. INTERNAL DEFENSE DEVELOPMENT; SERVICE ORIENTATION. 1 HOUR. The six major operational roles which may be employed to accomplish stability

objectives and the purposes, concepts, and modes of performing these roles. Customs of the service; conduct and code of the officer; management of personal affairs; discussion of requirements and problems inherent to entrance on active duty. Prerequisite: MilS. 203.

210. MILITARY COMMUNICATIONS. 1 HOUR. Means and principles of signal communication, codes, authentication, and communication security; characteristics, operation, and employment of radio and wire equipment; maintenance of signal communication equipment. Prerequisite: MilS. 106.

MUSIC

100. FUNDAMENTALS OF MUSIC THEORY. 4 HOURS. For the general student. Notation, metrical organization and rhythmic structure, scales and key signatures, intervals, triads, ear training, and sight singing.

101. THEORY OF MUSIC. 3 HOURS. Summary of fundamentals of music theory, melodic analysis, introduction to harmony, and related keyboard drill. Prerequisites: Approval of the department by examination or audition and concurrent registration in Mus. 104 and 170.

102. THEORY OF MUSIC. 3 HOURS. Triads, dominant sevenths and their inversion; introduction to nonharmonic tones and elementary modulation; small two-part and three-part forms; harmonic analysis; related keyboard drill. Prerequisite: Mus. 101 or the equivalent.

103. THEORY OF MUSIC. 3 HOURS. Secondary dominants and nondominant sevenths, continuation of nonharmonic tones and modulation; larger binary and ternary forms; related harmonic analysis and keyboard drill. Prerequisite: Mus. 102 or the equivalent.

104. EAR TRAINING. 1 HOUR. The development of aural perception and sight-singing skills; material is correlated with that in Music 101. Prerequisite: Concurrent registration in Mus. 101.

105. EAR TRAINING. 1 HOUR. The development of aural perception and sight-singing skills; material is correlated with that in Music 102. Prerequisite: Mus. 104 or the equivalent.

106. EAR TRAINING. 1 HOUR. The development of aural perception and sight-singing skills; material is correlated with that in Music 103. Prerequisite: Mus. 105 or the equivalent.

110. CONVOCATION/RECITAL. 0 HOURS. Required of all music majors. A weekly convocation for performances or lectures by students, faculty, or visiting artists. Prerequisite: Music major.

130. INTRODUCTION TO MUSIC I. 4 HOURS. For the general student. May not be taken for credit by music majors or minors. The principal elements of music; designed to develop an understanding of musical values.

131. INTRODUCTION TO MUSIC II. 4 HOURS. For the general student. May not be taken for credit by music majors or minors. A survey of principal style periods and their chief forms. Prerequisite: Mus. 130.

151. CONCERT BAND. 1 HOUR. Introduction to all types of band literature. Regular performances thoughout the school year. Field trips may be required. Prerequisite: Consent of the instructor.

152. ORCHESTRA. 1 HOUR. Instrumental ensemble; performance of important instrumental literature of varied types. Prerequisite: Consent of the instructor.

153. CHOIR. 1 HOUR. Introduction to important choral literature of all periods. Regular performances throughout the school year. Field trips may be required. Prerequisite: Consent of the instructor.

154. CHAMBER CHOIR. 1 HOUR. Select group of approximately 30 singers. Performance of music literature of all periods, composed for small ensembles. Field trips may be required. Prerequisite: Consent of the instructor.

155. MADRIGAL SINGERS. 1 HOUR. Small, very select group; performance of music literature primarily of the pre-Baroque periods. Prerequisite: Consent of the instructor.

156. CHORUS. 1 HOUR. Ensemble singing primarily for average and beginning singers. Stress on choral technique and vocal development. Prerequisite: Consent of the instructor.

158. PREP BAND. 1 HOUR. Designed for less experienced players who wish to meet required skills for concert band. Prerequisite: Consent of the instructor.

159. JAZZ LABORATORY ENSEMBLE. 1 HOUR. May be repeated for credit. Same as Black Studies 159. Practical experience in the preparation and performance of jazz compositions and arrangements; improvisational procedures. Regular performances throughout the school year. Field trips may be required. Prerequisite: Consent of the instructor determined by an audition.

170. PIANO I. 2 HOURS. Style and interpretation in performance; the development of keyboard skills in sight reading, transposition, improvisation, and ensemble playing. Must be repeated three times or until the minimum level of performance is certified by a departmental jury examination. No more than 6 credit hours may be earned. Prerequisites: Music major or minor and approval of the department.

171. PIANO II. 2 HOURS. Continues Music 170. Must be repeated three times or until the minimum level of performance is certified by a departmental jury examination. No more than 6 credit hours may be earned. Prerequisite: Mus. 170 and approval of the department.

180. MUSIC PERFORMANCE. 2 HOURS. May be repeated for credit. Private instruction in voice, woodwinds, brass, strings, percussion, and keyboard instruments. Prerequisites: Music major or minor or concurrent enrollment in a performing University organization and approval of the department.

201. THEORY OF MUSIC. 3 HOURS. Continuation of nondominant seventh chords; introduction to ninth, eleventh, thirteenth chords, and chromatic harmony; analysis of single-movement forms; harmonic analysis of music from the eighteenth and early nineteenth centuries; related keyboard drill. Prerequisite: A grade of C or better in Mus. 103 and 106 or the equivalent.

202. THEORY OF MUSIC. 3 HOURS. Continuation of chromatic harmony; harmonic and structural analysis of music from the middle to the late nineteenth century; related keyboard drill. Prerequisite: Mus. 201 or the equivalent.

203. THEORY OF MUSIC. 3 HOURS. Harmony from the late nineteenth to the early twentieth centuries; harmonic and structural analysis; related keyboard drill. Prerequisite: Mus. 202 or the equivalent.

204. EAR TRAINING. 1 HOUR. The development of aural perception and sight-singing skills; material is correlated with that in Music 201. Prerequisite: Mus. 106 or the equivalent.

205. EAR TRAINING. 1 HOUR. The development of aural perception and sight-singing skills; material is correlated with that in Music 202. Prerequisite: Mus. 204 or the equivalent.

206. EAR TRAINING. 1 HOUR. The development of aural perception and sight-singing skills; material is correlated with that in Music 203. Prerequisite: Mus. 205 or the equivalent.

207. COMPOSITION I. 4 HOURS. Class and individual instruction in the basic techniques of musical composition. Practice in the construction of phrases and sentences leading to composition of music in the small forms. Prerequisites: Mus. 203 and 206.

208. COMPOSITION II. 4 HOURS. Continues instruction in the basic techniques of musical composition. Experience in writing works of moderate scope for vocal and instrumental combinations ranging from solo to small ensemble. Prerequisite: Mus. 207.

214. MUSIC IN THE UNITED STATES. 4 HOURS. Historical survey from the *Bay Psalm Book* to the present. Prerequisite: Sophomore standing.

215. OPERA. 4 HOURS. Historical survey tracing the growth and development of opera from its beginnings to the present. Prerequisite: Sophomore standing.

216. CHAMBER MUSIC. 4 HOURS. The growth and development of chamber music from the Baroque period to the present. Prerequisite: Sophomore standing.

217. THE SYMPHONY. 4 HOURS. Historical survey of the growth and development of the symphony from its beginnings to the present. Prerequisite: Sophomore standing.

218. THE CONCERTO. 4 HOURS. Historical survey tracing the growth and development of the concerto from its beginnnings to the present. Prerequisite: Sophomore standing.

219. KEYBOARD LITERATURE. 4 HOURS. Historical survey tracing the growth and development of keyboard literature from Mozart through Debussy. Prerequisite: Sophomore standing.

220. EXPRESSIONISM. 4 HOURS. Expressionism as one reaction to the cultural crisis of the early twentieth century centering on the music of Schönberg, Berg, and Webern. Prerequisite: Sophomore standing.

230. MUSIC HISTORY I. 4 HOURS. Middle Ages and Renaissance. A general survey from monophony to 1600. Prerequisites: Junior standing and Mus. 103 and 106.

231. MUSIC HISTORY II. 4 HOURS. Baroque and classical. A general survey from 1600 to 1825. Prerequisite: Mus. 230.

232. MUSIC HISTORY III. 4 HOURS. Romantic and twentieth century. A general survey from about 1825 to the present. Prerequisite: Mus. 231.

240. MUSIC IN WORLD CULTURES I: INTRODUCTION. 4 HOURS. The scope and methodology of music in world cultures. Prerequisite: Sophomore standing.

241. MUSIC IN WORLD CULTURES II: AFRICAN AND AMERICAN INDIAN. 4 HOURS. The music of black Africa and of the American Indian. Prerequisites: Sophomore standing and Mus. 240.

242. MUSIC IN WORLD CULTURES III: INDIA AND JAPAN. 4 HOURS. Prerequisites: Sophomore standing and Mus. 240.

249. MUSIC SKILLS AND RUDIMENTS. 4 HOURS. Open only to students in the College of Education. Notation and elementary music theory coupled with the development of basic performance skills on piano and recorder; melodic and rhythmic dictation and sightsinging. Prerequisite: Junior standing.

250. MUSIC FOR ELEMENTARY TEACHERS. 4 HOURS. Open only to students in the College of Education. Required for state elementary teaching certificates. Materials and methods for teaching basic music concepts through creating and reading music; playing instruments, listening, singing; body movement. Prerequisite: Mus. 249 or proficiency examination.

288. THE INTELLECTUAL REVOLUTION OF THE SEVENTEENTH AND EIGHTEENTH CENTURIES AS VIEWED THROUGH THE ARTS. 4 HOURS. Same as History of Architecture and Art 288 and Humanities 288. Evidence in the visual arts and music of the impact of the new cosmology on men's minds, imaginations, and emotions. Prerequisite: Sophomore standing.

289. NEW PERCEPTIONS IN VISUAL ARTS, MUSIC, AND SCIENCE. 4 HOURS. Same as Humanities 289. The extended sensory range of the twentieth century as represented in the visual arts, music, and science. Prerequisite: Sophomore standing.

298. SELECTED TOPICS IN MUSIC. 1 TO 6 HOURS. May be repeated for credit. Intensive study in specialized areas of music history, music theory, and musicology. Prerequisite: Approval of the department.

299. INDIVIDUAL STUDY. 1 TO 6 HOURS. May be repeated for credit for a maximum of 8 hours. Selected topics for individual investigation. This course number may be used for student-initiated courses. Prerequisites: Mus. 203, 232, and approval of the department.

300. SIXTEENTH CENTURY COUNTERPOINT. 3 HOURS. Late Renaissance music. Analysis of representative scores and written assignments in sixteenth century contrapuntal style. Prerequisites: Mus. 203 and 206 or approval of the department.

301. EIGHTEENTH CENTURY COUNTERPOINT. 3 HOURS. Middle-to-late Baroque music. Analysis of representative scores and written assignments in eighteenth century contrapuntal style. Prerequisite: Mus. 300 or approval of the department.

302. FORM AND ANALYSIS. 3 HOURS. The melodic, rhythmic, harmonic, and structural analytic procedures of traditional musical form. Analysis of representative scores from the eighteenth to the twentieth centuries. Prerequisite: Mus. 301.

303. COMPOSITIONAL TECHNIQUES OF THE TWENTIETH CENTURY. 4 HOURS. European and American twentieth century music. Analysis of representative scores and written assignments in composition in one or more of the several contemporary idioms. Prerequisite: Mus. 302 or consent of the instructor.

320. PROSEMINAR IN MUSIC. 2 TO 4 HOURS. May be repeated for credit for a maximum of 12 hours. Selected topics for intensive study in specialized areas of musicology or music theory. Prerequisite: Senior standing as a music major.

330. MUSIC AS EXPERIENCE. 4 HOURS. Study of the musical experience as found in the writings of theorists, composers, musicians, historians, critics, and philosophers. Prerequisites: Junior standing, Mus. 130 and one 200-level course in music.

NATURAL SCIENCES (NatS)

101. NATURAL SCIENCES—THE PHYSICAL UNIVERSE. 4 HOURS. Same as Physics 121. Atomic theory to cosmology; physical laws and the nature of matter in the evolving universe. Prerequisite: High school algebra.

102. NATURAL SCIENCES—THE EVOLVING EARTH. 4 HOURS. Same as Geological Sciences 122. The concept of time in geology: the composition, structure, and evolution of the earth. Two or three all-day Saturday field trips are required. Prerequisite: NatS. 101 or consent of the instructor.

103. NATURAL SCIENCES—CHEMICAL EVOLUTION. 4 HOURS. Same as Chemistry 103. The architecture of matter: energy and the molecular basis of life and evolution.

104. NATURAL SCIENCES—LIFE EVOLVING. 4 HOURS. Same as Biological Sciences 124. Genetics, ecology, and evolution: the interaction of life and its environment—past, present, and future. Prerequisite: NatS. 103 or consent of the instructor.

PHILOSOPHY

101. INTRODUCTION TO PHILOSOPHY. 4 HOURS. Small-group conferences on assigned papers are required. Some of the more significant problems that arise in such philosophical disciplines as metaphysics, the theory of knowledge, and the philosophies of religion, science, and history.

102. ELEMENTARY LOGIC. 4 HOURS. Clarity and validity in argument; detection of fallacies; introduction to the use of symbols in constructing proofs.

103. INTRODUCTION TO ETHICS. 4 HOURS. Small-group conferences on assigned papers are required. Examination of representative classical and modern ethical philosophies; their import for social and political thought.

150. CLASSICS IN THE PHILOSOPHY OF SCIENCE. 4 HOURS. Primary sources in the philosophy of science that have decisively influenced the development of modern science and Western thought since ancient times. Prerequisite: Sophomore standing.

201. ANCIENT PHILOSOPHY. 4 HOURS. The development of Greek and Roman philosophy. Prerequisite: Junior standing or two courses in philosophy.

202. MEDIEVAL PHILOSOPHY. 4 HOURS. Reading and discussion of selected philosophical works from St. Augustine through William of Ockham. Prerequisite: Junior standing or two courses in philosophy.

203. HISTORY OF MODERN PHILOSOPHY. 4 HOURS. The development of Western philosophy from Descartes through Kant. Prerequisite Junior standing or two courses in philosophy.

204. PHILOSOPHICAL TOPICS IN THE LITERATURE OF BLACK PEOPLE. 4 HOURS. Careful examination of the works of Frederic Douglass, Solomon Northrup, Franz Fannon, and other black writers; the philosophical themes and implications of these works. A systematic attempt to examine the phenomenology of the enslaved and to give philosophical and psychological meaning to the manner in which the enslaved (the oppressed) becomes aware of his enslavement and the means by which he copes with his enslavement and his oppressor. Prerequisite: Phil. 101.

206. AMERICAN PHILOSPHY. 4 HOURS. Main currents of philosophical thought in America. Prerequisite: One course in philosophy.

210. PHILOSOPHIC PROBLEMS IN ART AND ART APPRECIATION. 4 HOURS. The nature of good painting and the characteristics of the reasons that can be offered in support of critical evaluations of works of art.

211. INTRODUCTION TO FORMAL LOGIC. 4 HOURS. Not open to students who have taken Philosophy 321. Elementary theory and methods of symbolic logic. Prerequisite: Phil. 102 or consent of the instructor.

212. PHILOSOPHY OF ART. 4 HOURS. Philosophical theories of art from ancient Greece to the present. Plato, Aristotle, Longinus, Hume, Kant, Nietzsche, Dewey, and others.

214. PHILOSOPHY OF RELIGION. 4 HOURS. Same as Religious Studies 214. Philosophical inquiry into the grounds of belief and the character of religious experience. Prerequisite: One course in philosophy.

215. PHILOSOPHICAL PSYCHOLOGY. 4 HOURS. Critical review of several important topics: behaviorism, the theory of action, emotions, the status of psychoanalytical explanations, determinism, dreaming, motivation. Prerequisite: Phil. 101 is recommended.

216. POLITICAL AND SOCIAL PHILOSOPHY. 4 HOURS. Philosophical bases of social and political institutions and practices. The nature of the state; justice and law; rights and natural rights; social utility and public interest.

218. INTRODUCTION TO ETHICAL THEORY. 4 HOURS. Survey of some of the important ethical theories. Prerequisite: Phil. 103 is recommended

222. INTRODUCTION TO THE PHILOSOPHY OF SCIENCE. 4 HOURS. The nature of scientific explanation and verification. The status of scientific theories; induction and probable inference.

224. PHILOSOPHY OF EDUCATION. 4 HOURS. The nature and aims of education, the relationship of philosophical disciplines, such as ethics and theory of knowledge, to educational theory, and the application to pedagogy of various philosophical ideas and systems.

230. KNOWLEDGE. 4 HOURS. Survey of some problems in the theory of knowledge. Philosophy 101 is recommended.

235. STUDIES IN EXISTENTIALIST LITERATURE. 4 HOURS. Same as Humanities 235 and Religious Studies 235. Imaginative works by Dostoevsky, Rilke, Kafka, Sartre, and Camus; selections from Pascal, Kierkegaard, Nietzsche, Jaspers, and Tillich. Prerequisite: Junior standing or consent of the instructor.

236. METAPHYSICS. 4 HOURS. Survey of some problems in metaphysics. Philosophy 101 is recommended.

240. ANALYSIS OF LANGUAGE. 4 HOURS. Survey of some problems in the philosophy of language. Philosophy 101 is recommended.

298. BASIC CONCEPTS AND PROBLEMS. 4 HOURS. Designed for philosophy majors, or for preparation for advanced study in philosophy. Survey of basic concepts and problems in epistemology, metaphysics, and value theory; extensive treatment of one or more problems from these fields. Normally to be taken after completing several 200-level courses and just before enrollment in 300-level courses. Prerequisite: Two or more courses in philosophy or consent of the instructor.

299. SEMINAR. 4 HOURS. May be taken twice. Selected topics. Prerequisites: Junior standing and approval of the department.

300. PHILOSOPHY OF SPACE AND TIME. 4 HOURS. Geometry and space, contingent and necessary properties of space and time, the direction and flow of time, effects preceding their causes, Zeno's paradoxes. Prerequisite: Phil. 298.

301. PLATO. 4 HOURS. Selected dialogues. Prerequisite: Phil. 298.

302. ARISTOTLE. 4 HOURS. May be repeated once for credit with permission of the department. Reading and discussion of some of the basic works. Prerequisite: Phil. 298.

303. CHINESE PHILOSOPHY. 4 HOURS. Development of the major Chinese philosophies. Prerequisite: Two courses in philosophy.

304. SEVENTEENTH CENTURY RATIONALISM. 4 HOURS. Selected readings and discussion from the works of Descartes, Spinoza, Leibniz, and others. Prerequisite: Phil. 298.

306. BRITISH EMPIRICISM. 4 HOURS. Selected readings from the works of such philosophers as Locke, Berkeley, and Hume. Prerequisite: Phil. 298.

308. KANT. 4 HOURS. Kant's philosophy, with emphasis on the *Critique of Pure Reason.* Prerequisite: Phil. 304 or 306 or 330 or consent of the instructor.

309. TOPICS IN THE HISTORY OF ETHICS. 4 HOURS. Intensive treatment of either an important person, such as Kant, or theory (utilitarianism) in the history of ethics. Specific topics are announced. Prerequisite: Phil. 218.

310. NINETEENTH CENTURY AND EARLY TWENTIETH CENTURY THOUGHT. 4 HOURS. May be repeated for credit with the approval of the department. Selections from the writings of Hegel, Schelling, Fichte, Schopenhauer, Marx and Engels, J.S. Mill, Nietzsche, McTaggart, Green, Bradley, Peirce, Perry, and others. Prerequisite: Phil. 298.

311. INDUCTIVE LOGIC. 4 HOURS. Traditional and contemporary problems of induction. Inductive logic and the theory of probability. Prerequisite: Phil. 298.

312. RECENT AND CONTEMPORARY PHILOSOPHY: ANALYSIS AND LOGICAL EMPIRICISM. 4 HOURS. Developments in recent philosophy which have their roots in the study of logic and language, such as logical atomism, positivism, and analytical philosophy. Prerequisite: Phil. 298.

313. THE CLAIMS OF SCIENCE AND RELIGION. 4 HOURS. Same as Religious Studies 313. Convergence and conflict between the results of science and the claims of religion; similarities and differences between their methods of inquiry. Prerequisites: Phil. 214 and one other course in philosophy.

314. RECENT AND CONTEMPORARY PHILOSOPHY: PHENOMENOLOGY AND EXISTENTIAL PHILOSOPHY. 4 HOURS. Important contributions to the phenomenological movement. Selected readings from Husserl, Heidegger, Jaspers, Sartre, Merleau-Ponty and others. Prerequisite: Two courses in philosophy.

321. INTRODUCTION TO FORMAL LOGIC. 4 HOURS. Not open to students who have taken, or are taking, Philosophy 211. Four meetings per week coincide with Philosophy 211 (see Philosophy 211 description). One additional meeting per week devoted to an introduction to elementary set theory plus extra topics related to work in Philosophy 211.

322. PROBLEMS IN THE FOUNDATIONS OF LOGIC AND MATHEMATICS. 4 HOURS. A survey of selected problems. Prerequisite: Phil. 211 or the equivalent.

330. THEORY OF KNOWLEDGE. 4 HOURS. The grounds of belief; the nature of truth; evidence and proof; other related epistemological problems. Prerequisites: Phil. 230 and 298.

332. ETHICS AND VALUE THEORY. 4 HOURS. The nature of moral judgments and moral reasoning; ethics as a normative discipline; definitions of "value"; ethical judgments as a kind of value judgment. Prerequisite: Two courses in philosophy, one of which must be a 200-level course.

334. AESTHETICS. 4 HOURS. The aesthetic object. Form, representation, and meaning in art. Art and knowledge. Prerequisite: Phil. 298.

336. TOPICS IN METAPHYSICS. 4 HOURS. Systematic analysis of selected metaphysical concepts, such as existence, substance and attribute, universals and particulars, change, identity, space and time, and the individual. Recent as well as traditional points of view are considered. Prerequisites: Phil. 236 and 298.

338. PHILOSOPHICAL ANALYSIS OF THE CONCEPT OF MIND. 4 HOURS. Presuppositions and logical interconnections involved in the use of such terms as "mind," "thought," "action," "intention," and "will." Prerequisite: Phil. 298.

340. PHILOSOPHY OF LANGUAGE. 4 HOURS. Philosophical and logical problems concerned with the nature of meaning and the structure of language. Prerequisites: Phil. 211, 240, and 298.

343. FORMAL LOGIC I. 4 HOURS. Same as Mathematics 343. Propositional logic, logic of quantifiers, and identity and completeness. Prerequisite: Consent of the instructor; none for mathematics majors.

344. FORMAL LOGIC II. 4 HOURS. Same as Mathematics 344. Continues Philosophy 343. Mathematical analysis of decidability and computability. Arithmetization of syntax. Incompleteness and undefinability theorems. Introduction to axiomatic set theory. Prerequisite: Phil. 343.

345. PHILOSOPHICAL PROBLEMS OF THE SCIENCES. 4 HOURS. May be repeated for credit with the permission of the department. Reading and discussion of selected works on the aims and methods of science, the status of scientific theories, natural laws and theoretical entities, and the nature of explanation. Prerequisite: Phil. 298.

347. PHILOSOPHY OF LAW. 4 HOURS. Topics vary. Emphasis may be on systems of criminal and civil laws; distinctions between legislation and judicial decision making; moral sources and justification of statutes and decisions; criminal and civil responsibility; *mens rea;* theories of punishment; civil disobedience; human rights and civil rights; civil liberties. The writings of philosophers. Landmarks of jurisprudence and important court cases may be studied. Prerequisite: Phil. 298.

351. PROBLEMS IN THE PHILOSOPHY OF MATHEMATICS. 4 HOURS. Intensive study of a particular problem or nexus of problems in the philosophy of mathematics. The problems vary from quarter to quarter. Prerequisite: Phil. 298.

399. INDEPENDENT STUDY. 1 TO 8 HOURS. Independent study, under the supervision of a staff member, of a topic not covered in the regular curriculum. The course is offered at the request of the student and only at the discretion of the staff members concerned. Prerequisite: Approval of the department.

PHYSICAL EDUCATION (PE)

150. INTRODUCTION TO PHYSICAL EDUCATION. 2 HOURS. For physical education majors. Historical highlights, the role of physical education in modern society, basic philosophical and scientific principles of the profession. Professional organizations, literature, and career opportunities.

151. PHYSIOLOGY OF EXERCISE PRACTICUM. 2 HOURS. Laboratory experience in applied physiology; cardiovascular endurance, muscle coordination, general motor fitness. Prerequisite: Concurrent registration in PE 254.

152. AQUATICS. 2 HOURS. Regardless of swimming ability, the student actively experiences and evaluates the basic principles of motion and endurance in the water. Prerequisite: Credit or concurrent registration in PE 253.

153. GYMNASTICS. 2 HOURS. Utilization of gymnastic apparatus to illustrate the application of kinesiological principles. Prerequisite: Credit or concurrent registration in PE 253.

154. RHYTHMS, DANCE, AND FREE EXERCISE. 2 HOURS. Introduction to the basic skills, concepts, and aesthetic qualities of rhythmic activities. Prerequisite: Credit or concurrent registration in PE 253.

155. FUNDAMENTALS OF ARCHERY. 1 HOUR. Skills, progression, and analysis.

156. FUNDAMENTALS OF BADMINTON. 2 HOURS. Skills, progression, and analysis.

157. FUNDAMENTALS OF BOWLING. 1 HOUR. Skills, progression, and analysis.

158. FUNDAMENTALS OF FENCING. 2 HOURS. Skills, progression, and analysis of nonelectric foil fencing.

159. FUNDAMENTALS OF GOLF. 2 HOURS. Skills, progression, and analysis.

160. FUNDAMENTALS OF HANDBALL. 2 HOURS. Skills, progression, and analysis.

161. FUNDAMENTALS OF TENNIS. 2 HOURS. Skills, progression, and analysis.

162. FUNDAMENTALS OF TRACK AND FIELD. 2 HOURS. Skills, progression, and analysis.

163. FUNDAMENTALS OF WEIGHT TRAINING. 2 HOURS. Skills, progression, and analysis that relate to physical development through weight training.

164. FUNDAMENTALS OF WRESTLING. 2 HOURS. Skills, progression, and analysis.

170. FUNDAMENTALS OF BASEBALL. 4 HOURS. Skills, rules, and tactics; movement analysis; practice methods.

171. FUNDAMENTALS OF BASKETBALL. 2 HOURS. Skills, progression, and analysis.

172. FUNDAMENTALS OF FIELD HOCKEY. 2 HOURS. Skills, progression, and analysis.

173. FUNDAMENTALS OF NONTACKLE FOOTBALL AND FLICKERBALL. 2 HOURS. Skills, progression, and analysis.

174. FUNDAMENTALS OF SOCCER AND SPEEDBALL. 2 HOURS. Skills, progression, and analysis.

175. FUNDAMENTALS OF SOFTBALL. 2 HOURS. Skills, progression, and analysis.

176. FUNDAMENTALS OF TACKLE FOOTBALL. 4 HOURS. Skills, rules, and tactics; movement analysis; practice methods.

177. FUNDAMENTALS OF VOLLEYBALL. 2 HOURS. Skills, progression, and analysis.

181. FUNDAMENTALS OF COMPETITIVE SWIMMING. 2 HOURS. Skills, progression, and analysis. Prerequisite: Ability to swim 100 yards.

182. FUNDAMENTALS OF WATER POLO. 2 HOURS. Skills, progression, and analysis. Prerequisite: Ability to swim 100 yards.

183. FUNDAMENTALS OF SYNCHRONIZED SWIMMING. 2 HOURS. Skills, progression, and analysis. Prerequisite: Intermediate swimming ability.

184. FUNDAMENTALS OF DIVING. 2 HOURS. Skills, progression, and analysis. Prerequisite: Ability to execute a plain front dive.

190. FUNDAMENTALS OF BALLROOM DANCE. 2 HOURS. Introduction to ballroom dance: skills, rhythmic analysis, word cues, and history.

191. FUNDAMENTALS OF FOLK AND SQUARE DANCE. 2 HOURS. Skills and techniques of fundamental dance steps; rhythm analysis; cultural history. Emphasis on skill development.

192. FUNDAMENTALS OF JAZZ DANCE. 2 HOURS. Basic techniques and styles of modern jazz; choreographic principles and historical development.

193. FUNDAMENTALS OF MODERN DANCE. 2 HOURS. Introduction to dance as a performing art, the development of basic modern dance techniques, improvisation, compositional forms.

194. FUNDAMENTALS OF RHYTHMIC GYMNASTICS. 2 HOURS. May be repeated for credit with approval of the department. Theory of European gymnastic systems. Applications of techniques of rhythmic gymnastics with light hand apparatus. Emphasis on systems studied will vary. Prerequisite: PE 154.

196. PRODUCTION I: STAGING THE DANCE. 2 HOURS. Introduction to technical principles of dance and mechanical preparations of the theater for the stage performance, including the use of the human form, lighting, props, and costumes for stage effects. Field experience is required. Prerequisites: PEM 141, 147, 148 or PEW 104, 147, 148 or consent of the instructor.

197. PRODUCTION II: PRODUCTION MANAGEMENT. 2 HOURS. The organization and administration of a dance group and dance productions. Field experience is required. Prerequisite: PE 196 or consent of the instructor.

198. DANCE FOR CHILDREN. 3 HOURS. The development of rhythmic patterns in children, evaluation and lesson planning in elementary school dance, presentation of materials, uses of accompaniment and types of percussion instruments suitable for children. Prerequisite: PE 154.

199. ELEMENTARY SCHOOL GAMES. 3 HOURS. For kindergarten through eighth grade playground and gymnasium activities. Program planning, lesson planning, and source materials. Prerequisite: PE 150.

200. ADVANCED FENCING. 2 HOURS. Advanced skills, strategy, officiating, and teaching techniques for sabre, the electric foil, and epee. Prerequisite: PE 158.

201. ADVANCED GOLF. 2 HOURS. Advanced skills, strategy, officiating and teaching techniques, and skill progression. Prerequisite: PE 159.

202. ADVANCED GYMNASTICS. 2 HOURS. Advanced skills, strategy, officiating and teaching techniques, and skill progression. Prerequisite: PE 153 or consent of the instructor.

203. ADVANCED TENNIS. 2 HOURS. Advanced skills, officiating and teaching techniques, and strategies; emphasis on match play. Prerequisite: PE 161.

204. ADVANCED TRACK AND FIELD. 4 HOURS. Advanced development of track, field, and cross country skills. Prerequisites: PE 162, 253, and 254.

205. ADVANCED WRESTLING. 2 HOURS. Advanced skills, strategy, officiating and teaching techniques, and skill progression. Prerequisite: PE 164.

210. ADVANCED BASEBALL. 2 HOURS. Baseball strategy for high school and college coaching. Playing rules are discussed, interpreted, and tested in preparation for the baseball umpires' qualification examination. Prerequisite: PE 170.

211. ADVANCED BASKETBALL. 4 HOURS. Advanced skills, strategy, officiating and teaching techniques, and skill progression. Prerequisite: PE 171.

212. ADVANCED FIELD HOCKEY. 2 HOURS. Advanced skills, strategy, officiating and teaching techniques, and skill progression. Prerequisite: PE 172.

213. ADVANCED SOCCER. 2 HOURS. In–depth treatment of advanced skills, strategies, officiating and teaching techniques, and skill progression. Prerequisite: PE 174.

214. ADVANCED SOFTBALL. 2 HOURS. Advanced skills, officiating and teaching techniques, and skill progression. Prerequisite: PE 175.

215. ADVANCED TACKLE FOOTBALL. 2 HOURS. For students specializing in coaching football. Organization of a football program. Advanced concepts of offense, defense, and the kicking game. Prerequisite: PE 176.

216. ADVANCED VOLLEYBALL. 2 HOURS. Advanced skills, strategy, officiating and teaching techniques, and skill progression. Prerequisite: PE 177.

230. INSTRUCTIONAL TECHNIQUES IN GYMNASTICS. 2 HOURS. Development of the teaching skills required to coach or instruct students in gymnastics. Prerequisite: PE 153.

231. INSTRUCTIONAL TECHNIQUES IN SWIMMING. 2 HOURS. Organization, skills, and instructional techniques. Prerequisite: PE 152.

235. PRACTICUM IN PHYSICAL EDUCATION LEADERSHIP. 2 HOURS. Field experiences and lectures to facilitate the understanding of the educative process of youth through physical activity. Class management experience is provided. Prerequisite: PE 150.

240. INTRODUCTION TO RECREATION. 3 HOURS. Analysis of the structure and function of the recreation of man; its philosophy, concepts, and trends. Institutionalized recreation leadership, activities, and programs.

241. OUTDOOR RECREATION. 4 HOURS. Philosophy and principles underlying the methods and programs in outdoor recreation activities and events; special emphasis on outdoor education and enriching the leisure time program.

242. CAMP COUNSELING. 4 HOURS. The history and development of organized camping; camp administrative organization; analysis of program content and development; the nature and scope of counseling in relation to common camp behavior problems.

243. RECREATION PROGRAMS. 4 HOURS. Organization and conduct of recreation programs; importance of planning based on community needs, resources, and urban environment; techniques required for the promotion of balanced and comprehensive programs. Prerequisite: PE 240.

244. LEADERSHIP IN RECREATION. 4 HOURS. The nature of leadership; its new dimensions and group interpersonal relationships in the recreation setting. Prerequisite: PE 240.

245. CREATIVE LEISURE CRAFTS. 2 HOURS. Creative craft activities and projects suitable for playgrounds, recreation centers, and camps; emphasis on methods and techniques in the use of a variety of materials, programs, and class organization.

246. PLAYGROUND MANAGEMENT. 3 HOURS. The organization and management of playgrounds and community centers; focus on the planning and administering of playground activities, budgeting special events, and community involvement. Prerequisite: PE 243.

248. SUPERVISED FIELD CAMPING. 5 HOURS. Practical supervised experience in the planning and conduct of camp programs and activities. Students are actively involved in the application of camping theory and techniques, utilizing suburban and city camp settings. Prerequisite: PE 242.

249. CANOE CAMPING. 4 HOURS. A ten-day wilderness experience in the Boundary Water Canoe Area of the United States and Canada. Emphasis on canoeing, wilderness survival, equipment selection, and ecology. A fee is required. Prerequisite: Ability to swim 50 meters or consent of the instructor.

251. EVALUATION IN PHYSICAL EDUCATION. 4 HOURS. Laboratory experience in evaluation techniques for assessing skill, knowledge, attitude, motor achievement, and physical fitness status. Elementary techniques of test construction, statistical methods, and research procedures.

252. HISTORY AND PHILOSOPHY OF PHYSICAL EDUCATION. 4 HOURS. The historical and philosophical development of physical education from primitive to contemporary societies. Assumptions, trends, and leaders.

253. KINESIOLOGY. 5 HOURS. Biochemical analysis of human performance and its application to various sports and rhythmic and aquatic activities. Prerequisite: BioS. 133.

254. PHYSIOLOGY OF EXERCISE. 4 HOURS. The physiological mechanisms associated with physical exercise. Prerequisite: BioS. 134.

260. MOTOR LEARNING. 4 HOURS. The application of learning theory and research to the acquisition of motor skills. Prerequisites: PE 251, 253, and Psch. 100.

261. PERCEPTUAL-MOTOR DEVELOPMENT. 4 HOURS. Theories. Interpretation of research relating to human processing of sensory information and its relation to the development of motor patterns and skills. Applications to physical education instruction. Prerequisite: PE 253.

262. PROBLEMS IN PHYSICAL EDUCATION. 4 HOURS. Intensive reading and research on current problems in the field. Prerequisite: Junior or senior standing.

263. THERAPEUTIC ACTIVITIES. 4 HOURS. Recreational activities and therapeutic exercises for handicapped individuals. Organizing and administering recreational and exercise therapy.

264. PRINCIPLES AND PRACTICES OF EXERCISE THERAPY. 4 HOURS. Advanced study of all of the scientific areas applying to the principles and practices of physical restoration. Prerequisites: PE 253, 263.

269. HISTORY OF SPORTS. 4 HOURS. Sports of the Western World from ancient civilizations to modern times.

270. CLINICAL INTERNSHIP IN CORRECTIVE THERAPY. 15 HOURS. Training experience to increase clinical skills in recognition, differences, and applications of corrective therapy modalities. Ward and clinic experience in selected hospitals of the city. Prerequisites: PE 253, 263, 264.

275. ADAPTED PHYSICAL EDUCATION. 2 HOURS. A study of handicaps found among students. Adaptation of exercises and activities to accommodate individual needs. Prerequisites: BioS. 133 and PE 253.

276. ELEMENTARY SCHOOL PHYSICAL EDUCATION PROGRAMS AND ACTIVITIES. 2 HOURS. Program activities compatible with the developmental characteristics of elementary school children and with the educational objectives of the elementary school.

277. FIRST AID AND ATHLETIC TRAINING. 4 HOURS. American Red Cross first aid. Diagnostic procedures for athletic injuries; treatment. Prerequisite: BioS. 134.

278. INSTRUCTIONAL TECHNIQUES IN PHYSICAL EDUCATION. 4 HOURS. Application of affective, cognitive, and psychomotor principles in physical education class management, unit and lesson planning, and instructional techniques. Fundamental skills, knowledge, and practice of physical conditioning. Prerequisite: PE 235 or consent of the instructor.

279. ORGANIZATION AND CURRICULUM DEVELOPMENT IN PHYSICAL EDUCATION. 4 HOURS. Curriculum planning and evaluation processes based on growth and developmental factors to accommodate individual needs; organization of physical education programs, facility usage, budget and staffing patterns. Prerequisite: PE 150 or consent of the instructor.

280. ELEMENTARY SCHOOL PHYSICAL EDUCATION ACTIVITIES. 4 HOURS. For elementary education majors. Methods and materials for games, self-testing, and rhythmic activities applicable to all elementary grades. Prerequisite: Junior standing.

281. SUPERVISED TEACHING OF PHYSICAL EDUCATION. 2 HOURS. Laboratory experience teaching in the general education physical education classes under the direct supervision of the staff; managing, planning, and instructing. Assignment of classes by arrangement. Prerequisite: PE 278.

282. STUDENT COACHING. 4 HOURS. Coincides with student teaching. Preparation for, and supervised experience in, the field of coaching. Prerequisite: Concurrent registration in Ed. 270, 271.

285. ORGANIZATION AND ADMINISTRATION OF ATHLETICS. 3 HOURS. The organization and administration of interscholastic athletic competition. Prerequisites: Junior standing and PE 150.

286. ORGANIZATION AND ADMINISTRATION OF INTRAMURAL SPORTS PROGRAMS. 4 HOURS. Background and development of intramural sports programs. Principles of program building, scheduling, and supervision of activities; relationship to other school programs. Prerequisite: PE 150.

287. ORGANIZATION OF SCHOOL HEALTH PROGRAMS. 4 HOURS. The development of school health programs, the function and use of health sciences, healthful school living, the problems and needs of school children. Individual projects are required.

298. HONORS SEMINAR. 4 HOURS. Current topics and issues in physical education. Prerequisites: Junior standing and a cumulative 4.000 average.

300. ADMINISTRATIVE THEORY AND PRACTICE IN PHYSICAL EDUCATION. 4 HOURS. A theoretical approach to the development of administrative thought as it relates to physical education; emphasis on the understanding of concepts and models from the social sciences and their implications for leadership in the educational setting; development of a personal philosophy of administration. Prerequisite: PE 279.

301. EVALUATION IN PHYSICAL EDUCATION. 4 HOURS. The availability and value of evaluative tools in physical education; methods for administration of evaluative techniques; analysis of interpretation and use of the results from evaluative techniques; description of the construction of new evaluative instruments employed in physical education. Prerequisite: PE 251.

302. SYNTHESIS OF HUMAN MOVEMENT CONCEPTS. 4 HOURS. Integration of selected concepts from biomechanics, exercise physiology, psychology, and sociology as they apply to the development of meaningful human movement. Prerequisites: Senior standing and consent of the instructor.

303. INSTRUCTIONAL TECHNIQUES IN PHYSICAL EDUCATION. 4 HOURS. Theory and practice; special emphasis on the application of motor learning research to instructional techniques and teaching styles. Prerequisites: Senior standing and consent of the instructor.

305. SPECIAL PROJECTS IN PHYSICAL EDUCATION. 2 TO 4 HOURS. Independent research on special projects. Prerequisite: Approval of the student's project by a graduate faculty member.

306. THE SPORT AND PLAY OF AMERICA. 4 HOURS. The creation, importation, and derivation of sport and play in America; course of development and adaptation to the nature of American life; impact of the political, economic, cultural, and geographical scene on the character of sport and play. Special emphasis on sport and play in urban America. Prerequisite: PE 252.

308. ADAPTED PHYSICAL EDUCATION PROGRAMS. 4 HOURS. Organization and administration; content selection, screening techniques, and instructional designs with application of kinesiological, sociological, and psychological principles to the needs of atypical students. Prerequisite: PE 253.

313. CURRICULUM CONSTRUCTION IN PHYSICAL EDUCATION. 4 HOURS. Principles of curriculum development and evaluation for physical education; analysis of age characteristics, needs, interests, and goals of students in a variety of community settings and their implication for the curriculum; development of psychomotor behavioral objectives for curricular offerings for various learning groups. Prerequisite: Ed. 230.

370. PHILOSOPHY OF PHYSICAL EDUCATION. 4 HOURS. Historical development of the philosophies of physical education and the assumptions on which current professional philosophies rest. Theory of knowledge in physical education.

PHYSICAL EDUCATION FOR MEN (PEM)

100. DEVELOPMENTAL ACTIVITIES. 1 HOUR. Development and maintenance of physical fitness. Analysis of the effects and methods of exercise.

101. PRESCRIBED EXERCISES. 1 HOUR. May be repeated for a total of 6 hours. Exercises adapted to individual needs, capacities, and interests. Open only to students assigned by the Health Service.

102. PHYSICAL FITNESS. 1 HOUR. Practice in the development and appraisal of physical fitness through land activities. Prerequisite: PEM 100.

103. PHYSICAL FITNESS: AQUATICS. 1 HOUR. Development and appraisal of physical fitness through swimming activities. Prerequisite: PEM 100 and ability to swim 400 yards.

105. INTRODUCTION TO DANCE. 1 HOUR. Same as PEW 105. Designed specifically for students without previous dance experience. Man's use of movement as an art form. Introduction to technique, basis of dance styles. Experience with rhythm, form, space, and movement qualities through creative approaches to simple choreographic forms.

106. MODERN DANCE I. 1 HOUR. Same as PEW 103. Beginning modern dance. Elementary techniques from various modern dance styles. Experimentation with a variety of choregraphic forms. Experience in the use of dance elements.

107. BEGINNING SWIMMING. 1 HOUR. Skills, knowledge, attitudes, and conditions. Open only to nonswimmers.

108. INTERMEDIATE SWIMMING AND WATER POLO. 1 HOUR. Improvement of swimming skills of those who swim inefficiently; development of skills necessary to play water polo reasonably well. Prerequisite: Ability to swim 50 yards.

109. ADVANCED SWIMMING AND DIVING. 1 HOUR. Development of skill in competitive swimming strokes and diving. Prerequisite: Ability to swim 200 yards.

110. LIFE SAVING AND SKIN DIVING. 1 HOUR. For students who wish to learn life saving skills and to develop the fundamental skills and knowledge for skin diving. The American Red Cross Senior Life Saving Certificate is awarded upon successful completion of the course. Prerequisite: Ability to swim, for 100 yards, three of these four strokes: back, breast, crawl, and side.

112. INDIVIDUAL TUMBLING STUNTS. 1 HOUR. Skills, knowledge, attitudes, and conditions.

113. DOUBLE TUMBLING STUNTS. 1 HOUR. Skills, knowledge, attitudes, and conditions.

114. APPARATUS STUNTS. 1 HOUR. Skills, knowledge, attitudes, and conditions.

115. CIRCUS STUNTS. 1 HOUR. Skills, knowledge, attitudes, and conditions.

116. SABER FENCING. 1 HOUR. Skills, knowledge, attitudes, and conditions. Prerequisite: PEM 119 with a grade of C or better or consent of the instructor.

117. BOXING. 1 HOUR. Skills, knowledge, attitudes, and conditions.

118. WRESTLING. 1 HOUR. Skills, knowledge, attitudes, and conditions.

119. FOIL FENCING. 1 HOUR. Skills, knowledge, attitudes, and conditions.

120. PERSONAL DEFENSE ACTIVITIES. 1 HOUR. Skills, knowledge, attitudes, and conditions.

121. WEIGHT TRAINING. 1 HOUR. A program of weight training that contributes to improvement in strength and fitness. Prerequisite: Recommendation of the staff.

122. INDIVIDUAL ATHLETICS. 1 HOUR. Skills, knowledge, attitudes, and conditions.

123. WEIGHT LIFTING. 1 HOUR. Skills, knowledge, attitudes, and conditions.

124. TRACK AND FIELD ATHLETICS. 1 HOUR. Skills, knowledge, attitudes, and conditions.

125. FLICKERBALL. 1 HOUR. Skills, knowledge, attitudes, and conditions.

126. TOUCH FOOTBALL. 1 HOUR. Skills, knowledge, attitudes, and conditions.

127. SOFTBALL. 1 HOUR. Skills, knowledge, attitudes, and conditions.

128. SOCCER. 1 HOUR. Skills, knowledge, attitudes, and conditions.

129. VOLLEYBALL. 1 HOUR. Skills, knowledge, attitudes, and conditions.

130. BASKETBALL. 1 HOUR. Skills, knowledge, attitudes, and conditions.

131. SPEEDBALL. 1 HOUR. Skills, knowledge, attitudes, and conditions.

132. ARCHERY. 1 HOUR. Skills, knowledge, attitudes, and conditions.

133. SQUASH RACQUETS. 1 HOUR. Skills, knowledge, attitudes, and conditions.

134. HANDBALL. 1 HOUR. Skills, knowledge, attitudes, and conditions.

135. TENNIS. 1 HOUR. Skills, knowledge, attitudes, and conditions.

136. BADMINTON. 1 HOUR. Skills, knowledge, attitudes, and conditions.

137. BOWLING. 1 HOUR. Skills, knowledge, attitudes, and conditions.

138. GOLF. 1 HOUR. Skills, knowledge, attitudes, and conditions.

139. BACKYARD SPORTS. 1 HOUR. Skills, knowledge, attitudes, and conditions.

140. BOATING AND FISHING. 1 HOUR. Skills, knowledge, attitudes, and conditions.

141. MODERN DANCE II. 1 HOUR. May be repeated for credit. Same as PEW 104. Intermediate to advanced dance techniques from modern dance styles. Improvisation and choreographic forms. Prerequisite: PEM 106 or consent of the instructor.

142. BALLROOM DANCE I. 1 HOUR. Same as PEW 142. Introduction to ballroom dancing. Basic steps and variation of the most common social dance styles.

143. AMERICAN SQUARE DANCE. 1 HOUR. Same as PEW 143. Basic rhythms of square dance, etiquette and terminology, relation of round dances to American square dancing, appreciation of square dancing, several well-known American square dances.

144. FOLK-DANCE—ELEMENTARY. 1 HOUR. Same as PEW 144. Traditional rhythms of various countries, appreciation of the background.

145. MODERN JAZZ I. 1 HOUR. Same as PEW 145. Modern jazz development through creativity and structured movement. Prerequisite: PEM 105 or the equivalent.

146. BALLET I. 1 HOUR. Same as PEW 146. Introduction to classical ballet: basic techniques and terminology, appreciation, and historical development.

147. MODERN JAZZ II. 1 HOUR. May be repeated for credit. Same as PEW 147. Intermediate to advanced techniques and styles; choreographic principles; historical perspective in relation to contemporary usage. Prerequisite: PEM 145 or consent of the instructor.

148. BALLET II. 1 HOUR. May be repeated for credit. Same as PEW 148. Intermediate to advanced techniques; emphasis on principles, theories, and styles of performance; relationship to other art forms. Prerequisite: PEM 146 or consent of the instructor.

149. BALLROOM DANCE II. 1 HOUR. May be repeated for credit. Same as PEW 149. Advanced steps and variations. Prerequisite: PEM 142 or consent of the instructor.

PHYSICAL EDUCATION FOR WOMEN (PEW)

100. CONDITIONING ACTIVITIES. 1 HOUR. Maintenance and improvement of physical fitness through exercise and body control.

102. MODIFIED ACTIVITIES. 1 HOUR. For students assigned by the Health Service. Students with physical disabilities participate according to their abilities.

103. MODERN DANCE I. 1 HOUR. Same as PEM 106. Beginning modern dance. Elementary techniques from various modern dance styles. Experimentation with a variety of choreographic forms. Experience in the use of dance elements.

104. MODERN DANCE II. 1 HOUR. May be repeated for credit. Same as PEM 141. Intermediate to advanced dance techniques from modern dance styles. Improvisation and choreographic forms. Prerequisite: PEW 103 or consent of the instructor.

105. INTRODUCTION TO DANCE. 1 HOUR. Same as PEM 105. Designed specifically for students without previous dance experience. Man's use of movement as an art

form. Introduction to the technique basis of dance styles. Experience with rhythm, form, space, and movement qualities through creative approaches to simple choreographic forms.

106. SELF-DEFENSE FOR WOMEN. 1 HOUR. Self-defense techniques, including methods of preventing attacks. Introduction to individual techniques of breakfalls and basic throws. Emphasis on prevention rather than mat work.

107. APPARATUS. 1 HOUR. Vaulting over side horse; basic skills and routines for uneven bars and balance beam.

108. FREE EXERCISE. 1 HOUR. Components of free exercise: basic ballet, locomotor patterns, and tumbling; their use in routines.

110. BEGINNING SWIMMING. 1 HOUR. For students who are afraid of the water and unable to float or to swim. Water adjustment, floating, front crawl, and back crawl.

111. ADVANCED BEGINNING SWIMMING. 1 HOUR. Front crawl, back crawl, elementary back stroke, treading, floating, and plain front dive. Prerequisite: Front and back float.

112. INTERMEDIATE SWIMMING. 1 HOUR. Side stroke, breast stroke, surface dive. Review of front and back crawl and elementary back stroke. Prerequisite: Ability to swim one pool length (25 yards) each of the front crawl, the back crawl, and the elementary back stroke.

113. ADVANCED SWIMMING. 1 HOUR. Springboard dive, all basic swimming strokes, and the butterfly. Emphasis on endurance. Some racing techniques and synchronized swimming. Prerequisite: Ability to swim 25 yards of the front crawl, back crawl, elementary back stroke, breast stroke, and side stroke.

115. SYNCHRONIZED SWIMMING. 1 HOUR. The practice and presentation of strokes, stunts, sculling, and composition. Prerequisite: Intermediate swimming ability.

116. BEGINNING DIVING. 1 HOUR. Springboard dive, back dives, somersault and twisting dives. Prerequisite: Ability to swim and execute a plain front dive from the side of the pool.

117. SENIOR LIFE SAVING. 1 HOUR. Lifesaving and swimming skills for those interested in working in the field of aquatics. Prerequisites: Ability to execute a surface dive and to swim three strokes for 200 yards in good form.

118. ADVANCED SYNCHRONIZED SWIMMING. 1 HOUR. Practice and presentation of strokes and advanced synchronized swimming skills; emphasis on creativity. Prerequisite: PEW 115 or consent of the instructor.

120. ELEMENTARY SCHOOL GAME, SELF TESTING, AND RHYTHMIC SKILLS. 2 HOURS. Analysis and development of skills used in the physical education program in the elementary school. Prerequisite: Sophomore standing.

122. SPEEDBALL. 1 HOUR. Fundamentals of team play based on the development of individual game skills.

123. BASKETBALL. 1 HOUR. Skills and knowledge in beginning basketball.

124. VOLLEYBALL. 1 HOUR. Development of skill in volleyball play, knowledge of rules, refereeing.

125. SOFTBALL. 1 HOUR. Skills and knowledge.

126. FIELD HOCKEY. 1 HOUR. Skills, rules, and strategy.

127. SOCCER. 1 HOUR. Skills, rules, and strategy.

128. ADVANCED VOLLEYBALL. 1 HOUR. Advanced techniques and team play. Prerequisite: PEW 124 or consent of the instructor.

130. BADMINTON. 1 HOUR. Development of skills, knowledge of rules, tournament play.

131. BEGINNING GOLF. 1 HOUR. Historical development, values, rules, etiquette, and skill techniques. Use of woods, irons, and putters.

132. BOWLING. 1 HOUR. Development of skills.

133. FENCING. 1 HOUR. Fundamentals of foil fencing: mechanical principles, body movements, competition strategy. Prerequisite: PEW 100.

134. INTERMEDIATE FENCING. 1 HOUR. Skills, rules, tactics, officiating techniques, and competition. Prerequisite: PEW 133 or consent of the instructor.

135. ARCHERY. 1 HOUR. Knowledge, skills, and practice.

136. TENNIS. 1 HOUR. Development of skills, knowledge of rules, tournament play, and procedures.

137. ADVANCED TENNIS. 1 HOUR. Advanced skills. Emphasis on singles and doubles strategy. Prerequisite: PEW 136 or consent of the instructor.

138. TRACK AND FIELD. 1 HOUR. Basic knowledge and skills.

141. STUNTS, TUMBLING, AND APPARATUS. 1 HOUR. Simple stunts and tumbling. Basic and intermediate levels of use on horse, buck, parallel bars, trampoline, and balance beam.

142. BALLROOM DANCE I. 1 HOUR. Same as PEM 142. Introduction to ballroom dancing. Basic steps and variations of the most common social dance styles.

143. AMERICAN SQUARE DANCE. 1 HOUR. Same as PEM 143. Basic rhythms of square dance, etiquette and terminology, relation of round dances to American square dancing, appreciation of square dancing, several well-known American square dances.

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148. BALLET II. 1 HOUR. May be repeated for credit. Same as PEM 148. Intermediate to advanced techniques, emphasis on principles, theories, and styles of performance; relationship to other art forms. Prerequisite: PEW 146 or consent of the instructor.

149. BALLROOM DANCE II. 1 HOUR. May be repeated for credit. Same as PEM 149. Advanced steps and variations. Prerequisite: PEW 142 or consent of the instructor.

PHYSICS

101. GENERAL PHYSICS (MECHANICS AND HEAT). 5 HOURS. For students in the College of Liberal Arts and Sciences and in the Department of Architecture. Dynamics of solids and heat. Lectures with demonstrations and recitations; laboratory. Prerequisite: Trigonometry.

102. GENERAL PHYSICS (ELECTRICITY, MAGNETISM, AND WAVES). 5 HOURS. For students in the College of Liberal Arts and Sciences and in the Department of Architecture. Electricity and magnetism, particles and fields, electromagnetic waves, and behavior of waves. Lectures with demonstrations and recitations; laboratory. Prerequisite: Phys. 101.

103. GENERAL PHYSICS (MODERN PHYSICS). 5 HOURS. For students in the College of Liberal Arts and Sciences and in the Department of Architecture. Relativity, quantum mechanics, atomic structure, and the nucleus. Lectures with demonstrations and recitations; laboratory. Prerequisite: Phys. 102.

111. GENERAL PHYSICS I (MECHANICS). 4 HOURS. Scalars and vectors; kinematics in one and two dimensions, conservation of momentum; Newton's laws; inertial systems, circular motion; work, potential energy, conservation of energy; harmonic motion. Lecture and discussion. Prerequisite: Credit or registration in Math. 131.

112. GENERAL PHYSICS II (MECHANICS, THERMODYNAMICS). 5 HOURS. Angular momentum, moment of inertia; gravitational force, planetary motion; introduction to the physics of fluids; first and second laws of thermodynamics; the ideal gas; kinetic theory of gases. Lecture, discussion, and laboratory. Prerequisites: Phys. 111 and credit or registration in Math. 132.

113. GENERAL PHYSICS III (ELECTRICITY AND MAGNETISM). 5 HOURS. Coulomb's law, Gauss' law; electrostatic field, potential; capacitance, resistance, D.C. circuits; the magnetic force, Biot-Savart law, Ampere's law; motion of charged particles in electromagnetic fields; electromagnetic induction. Lecture, discussion, and laboratory. Prerequisites: Phys. 112 and credit or registration in Math. 133.

114. GENERAL PHYSICS IV (WAVE PHENOMENA AND RELATIVITY). 5 HOURS. Displacement current, Maxwell's equations; basic wave behavior; the wave equation; sound, water, and electromagnetic waves; reflection, refraction, interference, diffraction; geometrical optics; introduction to the special theory of relativity. Lecture, discussion, and laboratory. Prerequisite: Phys. 113.

121. NATURAL SCIENCES—THE PHYSICAL UNIVERSE. 4 HOURS. Same as Natural Sciences 101. Atomic theory to cosmology; physical laws and the nature of matter in the evolving universe. Prerequisite: High school algebra.

131. CLASSICAL PHYSICS I: MECHANICS. 4 HOURS. Forces and acceleration in one and two dimensions. Inertial reference frames, rotating coordinate systems. Newtonian mechanics; graphical techniques and differentiation. Impulse and integration; momentum, conservation of momentum; energy, conservative forces, potential energy; harmonic motion. Kepler's laws, planetary motion, the gravitational force. Lecture and laboratory. Prerequisite: Credit or registration in Math. 131 or approval of the department.

132. CLASSICAL PHYSICS II: ELECTRODYNAMICS. 3 HOURS. Harmonic motion; gravitation, orbital motion; Coulomb's laws; the electric field; potential and capacitance, dielectrics; effects and sources of magnetic fields; electromagnetic induction; inductance. Prerequisite: Phys. 131 or approval of the department.

209. INTRODUCTION TO ASTRONOMY. 4 HOURS. Same as Geography 209. An introductory and essentially nonmathematical course for superior students who are not science majors. Prerequisite: Consent of the instructor.

221. MODERN PHYSICS. 4 HOURS. Kinetic theory, atomic nature of matter; thermal radiation, photons, photoelectric effect; atomic spectra, Bohr model of the atom; wave and particle aspects of matter; elements of nuclear and particle physics. Lecture and discussion. Prerequisite: Phys. 114.

222. MODERN PHYSICS LABORATORY. 1 HOUR. Experiments in modern physics, including the photoelectric effect, Frank-Hertz experiment, radioactive decays, and others. Laboratory. Prerequisite: Phys. 221.

231. MODERN PHYSICS I. 4 HOURS. Waves and oscillations, Maxwell's equations, special relativity, wave-particle duality, Compton effect, photoelectric effect, electron diffraction. Prerequisite: Phys. 132 or approval of the department.

232. MODERN PHYSICS II. 5 HOURS. Quantum mechanical theory, Schrodinger equation, wave functions and their significance, eigenvalues, complex atoms, molecular binding, statistics of identical particles, solids, superconductivity, lasers, elements of nuclear physics. Prerequisite: Phys. 231.

291. SEMINAR. 1 HOUR. Topics to be arranged. Prerequisites: Senior standing and consent of the instructor.

292. UNDERGRADUATE RESEARCH. 2 TO 4 HOURS. Research under the close supervision of a faculty member. Prerequisites: Senior standing and consent of the instructor.

293. SPECIAL PROBLEMS. 2 TO 4 HOURS. Special problems or reading by special arrangement with the faculty. Prerequisites: Senior standing and consent of the instructor.

301. ELECTRICITY AND MAGNETISM I. 4 HOURS. Vector calculus; electrostatic potential and fields in vacuum and material media; energy concepts; boundary value problems. Prerequisites: Phys. 114 and Math. 321.

302. ELECTRICITY AND MAGNETISM II. 4 HOURS. Magnetostatics; vector potential; magnetic materials; time-varying fields and electromagnetic induction; Maxwell's equations. Prerequisite: Phys. 301.

303. ELECTRICITY AND MAGNETISM III. 4 HOURS. Propagation of electromagnetic waves; reflection, refraction, and dispersion; guided waves; radiation; selected topics. Prerequisite Phys. 302.

304. ELECTRONICS I. 4 HOURS. Theory of electronic devices, linear and nonlinear analysis, applications of vacuum and semiconductor devices to circuits, amplifers, biasing, feedback, oscillators, and special circuits. Prerequisite: Phys. 301. Phys. 302 and 303 are recommended.

305. ELECTRONICS II. 4 HOURS. Pulse-shaping networks, logic circuits, control circuits, distributed amplifiers, special problems of transducers, special signal-to-noise techniques. Prerequisite: Phys. 304.

321. QUANTUM MECHANICS I. 4 HOURS. The basic theory of the mechanics governing microscopic systems. Wave functions; probability density; operators; the Schroedinger equation with examples in one and three dimensions. Prerequisites: Phys. 114, 221 or approval of the department and Math. 220. Credit or registration in Math. 310 is recommended.

322. QUANTUM MECHANICS II. 4 HOURS. Mathematical structure of quantum mechanics; observables for a quantum state; angular momentum; perturbation theory; the Born approximation; the variational method; transition probabilities. Prerequisite: Phys. 321. Credit or registration in Math. 311 is recommended.

323. ELEMENTARY SOLID STATE PHYSICS. 4 HOURS. Individual projects are required. Crystal structure, thermal and dielectric properties of solids, free electron model of metals, band theory, semiconductor physics, dislocations and strength of solids. Prerequisite: Phys. 322.

331. NUCLEAR PHYSICS. 4 HOURS. Individual projects are required. Natural and artificial radioactivity, equipment for studying and producing high energy particles, nuclear disintegrations, interaction of nuclear particles with each other and with matter, cosmic rays, mesons, recent developments in high energy physics. Prerequisite: Phys. 321.

332. INTRODUCTION TO PARTICLE PHYSICS. 4 HOURS. Properties of the known elementary particles and their basic interactions, accelerators, and detectors. The discrete conservation laws with applications. Antiparticles, strangeness. Prerequisites: Phys. 321 and 322 or approval of the department.

341. THEORETICAL MECHANICS I. 4 HOURS. No credit for graduate physics majors. Individual projects are required. Motion of a particle in one, two, and three dimensions, Kepler's laws and planetary motion, scattering of particles, conversion between laboratory and center of mass coordinate systems, conservation laws, motion of a rigid body in two dimensions. Prerequisites: Phys. 114 or approval of the department and Math. 220.

342. THEORETICAL MECHANICS II. 4 HOURS. Individual projects are required. Statics of extended systems, moving coordinate frames, fictitious forces and conservation laws, special theory of relativity, mechanics of continous media. Prerequisite: Phys. 341.

343. THEORETICAL MECHANICS III. 4 HOURS. Individual projects are required. Rigid-body motion in three dimensions, motion in gravitational fields, generalized coordinates and Lagrange and Hamilton equations, equations of constraint, small vibration theory. Prerequisite Phys. 342.

361. THERMODYNAMICS. 4 HOURS. Thermodynamic variables, equilibrium, zero-th law of thermodynamics, isolated systems, the first law, Kelvin and Clausius statements of second law, Clausius inequality, irreversible criteria, equations of state, Clausius-Clapeyron equation, multicomponent systems, the third law, selected applications to physical systems. Prerequisite: Phys. 114.

362. STATISTICAL PHYSICS. 4 HOURS. Kinetic theory of dilute gases, elementary statistical concepts, equilibrium between interacting systems; temperature, entropy, statistical calculation of thermodynamic quantities, the microcanonical and canonical ensembles, quantum statistics of ideal gases, selected applications to physical systems. Prerequisite: Phys. 361.

366. INTRODUCTION TO THE MATHEMATICAL METHODS OF THEORETICAL PHYSICS I. 4 HOURS. Same as Mathematics 366. The traditional mathematical methods of theoretical physics from an intuitive point of view. Applications to problem solving in electrostatics and classical and quantum mechanics. Matrices and linear transformations, Fourier analysis, the partial differential equations of physics, and Sturm-Liouville theory. Introduction to special functions frequently encountered in physics. Prerequisites: Math. 310, 321; Phys. 303, 322, 342.

367. INTRODUCTION TO THE MATHEMATICAL METHODS OF THEORETICAL PHYSICS II. 4 HOURS. Same as Mathematics 367. The traditional mathematical methods of theoretical physics from an intuitive point of view. Applications to problem solving in electrostatics, electrodynamics, and classical and quantum mechanics. The special functions frequently encountered in physics and their use in the solution of boundary value problems, power series solutions, Green's functions, contour integral representations, and additional uses. Prerequisite: Phys. 366.

371. LIGHT (WAVE OPTICS). 4 HOURS. Wave propagation and Maxwell's equations, interference and interferometers, gratings, circular aperture, echelon, resolving power. Lecture and laboratory. Prerequisites: Phys. 114 and credit or registration in Math. 220.

372. LIGHT (MODERN OPTICS I). 4 HOURS. Crystals, polarized light, optics of metals, quantum theory of radiation, transition probability and oscillator strength, dispersion and scattering theory. Lecture and laboratory. Prerequisite: Phys. 371.

373. LIGHT (MODERN OPTICS II). 4 HOURS. Individual projects are required. Gaussian optics and general laws, special optical systems and applications. Image formation, finite image-error theory, spot diagrams. Necessary mathematical tools for Fourier analysis and transfer functions. Prerequisite: Phys. 372.

381. MODERN EXPERIMENTAL PHYSICS I. 4 HOURS. Techniques and experiments in the physics of atoms, atomic nuclei, molecules, the solid state, and other areas of modern physical research. Lecture and laboratory. Prerequisites: Phys. 304 and 331.

382. MODERN EXPERIMENTAL PHYSICS II. 4 HOURS. Continues Physics 381. Lecture and laboratory. Prerequisite Phys. 381.

391. PHYSICS SEMINAR. 1 TO 4 HOURS. Topics, to be arranged, cover recent developments in modern physics suitable for advanced undergraduate and graduate students. Prerequisites: Senior standing and approval of the department.

392. PHYSICS RESEARCH. 2 TO 4 HOURS. Research under the close supervision of a faculty member. Prerequisites: Senior standing and approval of the department.

393. SPECIAL PROBLEMS. 2 TO 4 HOURS. Special problems on reading in modern physics under individual arrangement with a faculty member. Prerequisites: Senior standing and consent of the instructor.

POLISH (Pol)

101. ELEMENTARY POLISH I. 4 HOURS. Four additional half hours per week in the language laboratory. For students who have had no work in Polish.

102. ELEMENTARY POLISH II. 4 HOURS. Four additional half hours per week in the language laboratory. Continues Polish 101. Prerequisite: Pol. 101 or the equivalent.

103. ELEMENTARY POLISH III. 4 HOURS. Four additional half hours per week in the language laboratory. Continues Polish 102. Prerequisite: Pol. 102 or the equivalent.

104. INTERMEDIATE POLISH I. 4 HOURS. Reading, oral-aural practice, and systematic grammar. Prerequisite: Pol. 103 or the equivalent. Students who have not taken Polish 103 at this University must take the Polish placement test.

105. INTERMEDIATE POLISH II. 4 HOURS. Continues Polish 104. Prerequisite: Pol. 104 or the equivalent. Students who have not taken Polish 104 at this University must take the Polish Placement test.

106. INTERMEDIATE POLISH III. 4 HOURS. Continues Polish 105. Prerequisite: Pol. 105 or the equivalent. Students who have not taken Polish 105 at this University must take the Polish placement test.

201. POLISH COMPOSITION AND CONVERSATION I. 4 HOURS. Composition and conversation, systematic grammar, vocabulary development, aural comprehension. Pronunciation drill, simple applied phonetics. Prerequisite: Pol. 106 or the equivalent.

202. POLISH COMPOSITION AND CONVERSATION II. 4 HOURS. Continues Polish 201. Prerequisite: Pol. 201 or the equivalent.

203. POLISH COMPOSITION AND CONVERSATION III. 4 HOURS. Continues Polish 202. Prerequisite: Pol. 202 or the equivalent.

215. POLISH CULTURE AND CIVILIZATION I. 4 HOURS. Given in English. Literary, philosophical, and theological works to the end of the eighteenth century; the main cultural forces that shaped Polish thought and manners. Prerequisite: Junior standing or consent of the instructor.

216. POLISH CULTURE AND CIVILIZATION II. 4 HOURS. Given in English. Continues Polish 215. Covers the period of the nineteenth and twentieth centuries. Prerequisite: Junior standing or consent of the instructor.

221. INTRODUCTION TO POLISH LITERATURE I. 4 HOURS. Same as Humanities 221. Major trends and authors from the Renaissance to Romanticism: Rey, Kochanowski, Potocki, Krasicki, and Boguslawski. Prerequisite: Junior standing or consent of the instructor.

222. INTRODUCTION TO POLISH LITERATURE II. 4 HOURS. Same as Humanities 222. Major trends and authors of the nineteenth century: Mickiewicz, Slowacki, Krasinski, Norwid, Fredro, Orzeszkowa, Sienkiewicz, and Prus. Prerequisite: Junior standing or consent of the instructor.

223. INTRODUCTION TO POLISH LITERATURE III. 4 HOURS. Same as Humanities 223. Major trends and authors of the twentieth century: Tetmajer, Kasprowicz, Staff, Lesmian, Wyspianski, Zeromski, Berent, Reymont, Brzozowski, Matuszewski, Tuwim, Slonimski, Wierzynski, and Pawlikowska. Prerequisite: Junior standing or consent of the instructor.

229. INDEPENDENT STUDY. 1 TO 6 HOURS. May be repeated for credit. Investigation of special problems under the general direction of a staff member. Prerequisites: Consent of the instructor and the head of the department.

340. POLISH ROMANTICISM. 4 HOURS. Polish-Russian literary relationship during the romantic period; major works of Mickiewicz, Slowacki, Krasinski, and Norwid. Prerequisite: Junior standing or consent of the instructor.

341. THE POLISH NOVEL. 4 HOURS. Major works from the eighteenth century to the present. Emphasis on Krasicki, Kraszewski, Sienkiewicz, Prus, Orzeszkowa, Zeromski, Nalkowska, Dabrowska. Prerequisite: Junior standing or consent of the instructor.

342. POLISH DRAMA. 4 HOURS. Major plays of Fredo, Mickiewicz, Slovacki, Krasinski, Wyspianski, Witkiewicz, Gombrowicz, and Mrozek. Prerequisite: Junior standing or consent of the instructor.

399. INDEPENDENT STUDY. 1 TO 4 HOURS. Investigation of special problems under the general direction of a staff member. Prerequisite: Consent of the instructor and the head of the department.

POLITICAL SCIENCE (PolS)

100. INTRODUCTION TO POLITICAL SCIENCE. 4 HOURS. A basic course; recommended for political science majors. Introduction to alternative conceptualizations of political life, commonalities and differences among political systems, explanation of individual political behavior. Emphasis on student participation in class and the writing of essays.

120. THE STUDY OF POLITICS: WHO RULES? 4 HOURS. A basic course; prerequisite for many upper-division political science courses. Introduction to the concepts and methods of political analysis, philosophy, and action. Substantive focus on the selection of political leaders in various political systems, particularly in the United States today.

130. HUMAN BEHAVIOR AND POLITICS. 4 HOURS. Introduction to the variety of complex ways in which psychology is relevant to the study of politics. Major focus on the human need for power, respect, and security and on the capacity for learning and perception. Personality differences: authoritarianism, sociability, political style. Groups, proximal groups, national character, and political leadership roles. Emphasis on the links between man and his polity. Prerequisite: PolS. 120 or consent of the instructor.

150. AMERICAN GOVERNMENT: BASIC PRINCIPLES. 4 HOURS. Historical development and operation of the American constitutional system. Analysis of federalism, civil liberties, and methods of popular control of government. Nature, structure, powers, and procedures of legislative, executive and judicial departments in the state and in the nation. Basic structure of local government.

151. AMERICAN GOVERNMENT: ORGANIZATION AND POWERS. 4 HOURS. Nature, structure, powers, and procedures of legislative, executive, and judicial departments in the state and in the nation. Basic structure of local government. Prerequisites: Enrollment in either the College of Education or the College of Liberal Arts and Sciences; secondary education student.

152. INTRODUCTION TO COMPARATIVE STUDY OF POLITICS. 4 HOURS. Principles of comparative political analysis and of the political systems of several countries outside the United States.

155. AMERICAN GOVERNMENT: BASIC PRINCIPLES. 4 HOURS. Honors course for Political Science 150. Prerequisite: University grade-point average of 4.000 or above or James Scholar status.

156. AMERICAN GOVERNMENT: ORGANIZATION AND POWERS. 4 HOURS. Honors course for Political Science 151. Prerequisite: PolS. 150 or 155 with James Scholar status or a 4.000 University grade-point average.

184. INTRODUCTION TO INTERNATIONAL RELATIONS. 4 HOURS. The basic characteristics of the international system, the nature of international relations, major problems and conflicts, the attempts to solve them. Nationalism, diplomacy, and war.

200. INTRODUCTION TO RESEARCH METHODS IN POLITICAL SCIENCE. 4 HOURS. Recommended for political science majors and students who intend to enroll in 300-level courses. Introduction to concepts and techniques essential for research on political phenomena: basic measurement theory; principles of research design; methods and techniques of data generation; applied data analysis. Prerequisite: Any one of PolS. 100, 120, 150, 151.

201. QUANTITATIVE STUDY OF POLITICS. 4 HOURS. Introduction to descriptive and inductive techniques essential for understanding behavioral political science. Especially recommended for students who plan to take advanced courses in political science.

205. INTRODUCTION TO URBAN POLITICS. 4 HOURS. The growth of cities in the United States; legal problems of cities; intergovernmental relations; charters and charter drafting; powers and forms of government organization; politics and pressure-group activity; administrative organization; municipal functions and services; revenue problems. Prerequisite: PolS. 120 or 151 recommended.

212. STATE GOVERNMENT. 4 HOURS. Organization and powers of state governments in the United States; constitutions and problems of revision; legislatures and legislation; administrative problems; the state judiciary and judicial reform; intergovernmental relations; financing major services. Prerequisite: PolS. 120 or 151.

215. INTRODUCTION TO MARXISM. 4 HOURS. Examination of some of the basic works of Marx and Engels with the aim of determining the importance of Marxian analysis for contemporary politics.

226. POLITICAL PARTIES. 4 HOURS. Historical development, organization, and functioning of state and national parties; committees, conventions, campaigns, and finances; party platforms and issues. Prerequisite: PolS. 120 or 151 recommended.

230. POLITICAL BEHAVIOR. 4 HOURS. An introduction; includes analysis of voting behavior, political leadership, policy formation, and related matters.

234. COMPARATIVE GOVERNMENT: GREAT BRITAIN. 4 HOURS. The government of Great Britain compared especially with that of the United States and the U.S.S.R. to illustrate and contrast the politics and governments of democracies and dictatorships.

235. COMPARATIVE GOVERNMENT: THE SOVIET UNION. 4 HOURS. The nature, evolution, and problems of the political and economic systems of the U.S.S.R.

236. COMPARATIVE GOVERNMENT: FRANCE AND GERMANY. 4 HOURS. Evolution of the political systems; analysis of reforms since 1945; operation of the governments and political parties.

240. POLITICAL SYSTEM OF CHINA. 4 HOURS. Analysis of techniques of political control, with special reference to the roles of ideology and organization; China's foreign policy, emphasis on both the Sino-Soviet conflict and the Sino-American confrontation. Prerequisite: PolS. 100 or 120 or 152.

241. POLITICAL SYSTEMS OF JAPAN and KOREA. 4 HOURS. Political systems of contemporary Japan, North Korea, and South Korea. Analysis of their respective political institutions, processes, behaviors, and foreign policies.

242. GOVERNMENT AND POLITICS OF LATIN AMERICA. 4 HOURS. Same as Latin American Studies 282. Comparative examination of the governments and politics of selected Latin American countries. Patterns of political leadership and followership, governmental processes, problems of development, and foreign political influence. Prerequisite: PolS. 152 or 280 or two courses in social science.

243. POLITICAL DEVELOPMENT OF THE MIDDLE EAST. 4 HOURS. Analysis of the contemporary politics of the countries of the Middle East, including the clash of traditional institutions and new social and political forces, such as Islam, nationalism, the military, political parties, and ideological trends. Prerequisite: PolS. 100 or 120 or 152. Political Science 280 is recommended.

245. AFRICAN POLITICS SOUTH OF THE SAHARA. 4 HOURS. Designed to provide the information and analytical tools to interpret current sub-Saharan African politics. Politics in traditional African societies; politics under colonial rule; the struggle for independence; post-independence politics. Prerequisite: PolS. 100 or 120. Political Science 152 and 280 are recommended.

246. POLITICAL PATTERNS IN WEST AFRICA. 4 HOURS. Government patterns in West Africa, their evolution, and the underlying problems they are designed to meet. One-party African socialism, various forms of multiparty government, and military regimes.

247. RACE AND POLITICS IN EAST AND SOUTH AFRICA. 4 HOURS. The dilemmas which racially plural societies in East and South Africa face in their attempts to achieve economic development, political stability, and social justice. Emphasis on Kenya, Tanzania, Rhodesia, and the Republic of South Africa.

Prerequisites: PolS. 100 or 120 or 150 and one course in either anthropology or history.

250. SPECIAL PROBLEMS IN POLITICS. 1 TO 8 HOURS. May be repeated for a maximum of 8 hours. Independent study under the guidance of a staff member. Arrangements as to content, approach, and credit must be concluded with the staff member concerned prior to registration. Prerequisites: Junior standing, political science major, three upper level courses in social sciences, and consent of the supervising instructor.

251. SYMPOSIUM ON POLITICS. 1 TO 8 HOURS. Course content and format is varied to adapt to the changing political scene.

255. COURTS, COLOR, AND THE CONSTITUTION. 4 HOURS. The efforts of black Americans to attain equality under federal constitutional standards. Focus on the executive, legislative, and judicial application of the Thirteenth, Fourteenth, and Fifteenth Amendments to racial discrimination in public education, transportation, housing, recreation, public accommodations, and the right to vote. Attention is also given to the emerging "new civil rights." Prerequisite: PolS. 120 or 150 or 151 or consent of the instructor.

261. PUBLIC ADMINISTRATION. 4 HOURS. Introduction to the principal concepts, ideas, and issues in public administration; the evolution of administrative thought and practice in the United States; a conceptual scheme for analysis of bureaucratic structure and behavior; the human factor in administration; the politics of the budgetary process; the environmental constraints on bureaucratic organization. The contributions of behavioral science research are stressed. Prerequisite: PolS. 120 or 150.

262. ORGANIZATIONAL BEHAVIOR. 4 HOURS. The nature and forms of politically relevant organizational behavior in modern society; particular emphasis on political environment of the organizations. Detailed analysis is made of one specific organization in its political-governmental setting. Prerequisite: PolS. 120 or 150.

263. COMPARATIVE AND INTERNATIONAL ADMINISTRATION. 4 HOURS. Analysis of bureaucratic structure and behavior in selected countries; examination of the problems and practices of the international civil service. Consideration of a conceptual framework for comparative administrative analysis. Prerequisite: PolS. 261 or 286 or one course in comparative government.

270. STRATEGIES FOR CHANGE. 4 HOURS. Examination of various forms of citizen activity and the conditions for their success in bringing about social, economic, and political change. Special emphasis on electoral strategies, issue strategies (antiwar, antipollution, and others), and administrative strategies. Prerequisite: 4 hours of political science, sociology, or contemporary history.

280. INTRODUCTION TO THE POLITICS OF DEVELOPING NATIONS. 4 HOURS. Same as Latin American Studies 280. Comparative study of the political, economic, and social characteristics of underdeveloped nations. Colonialism, nationalism, political ideologies, and problems of effective political organization and functions. Prerequisite: PolS. 100 or 120 or 152 or two courses in social science.

281. UNITED STATES FOREIGN POLICY. 4 HOURS. Analysis of the internal and external factors which influence the formulation and execution of the foreign policy of the United States. Major problems of contemporary foreign policy; constitutional, organizational, administrative, and intellectual factors.

285. COMPARATIVE FOREIGN POLICIES. 4 HOURS. Comparative study of foreign policies of major nations and blocs of nations. Major national interests, substance of foreign policies, and methods of policy formulation. Prerequisite: PolS. 152 or 184.

286. INTERNATIONAL ORGANIZATION. 4 HOURS. The evolution of international organizations; structure and operation of various types of contemporary international institutions. Special attention to the United Nations, its history, operations, and progress. Prerequisite: PolS. 184.

287. INTERNATIONAL LAW. 4 HOURS. The theory and practice of international law; particular reference to its evolving role in the contemporary world. Decisions of international tribunals, past and present, are analyzed and the contributions of the United Nations to the progressive development of international law are examined. Prerequisite: PolS. 184 or consent of the instructor.

288. INTERNATIONAL RELATIONS OF THE MIDDLE EAST. 4 HOURS. Regional problems, such as the drive for Arab unity, the Arab-Israeli dispute, the role of the region in world politics, and the decline of Western influence in the area. Prerequisite: PolS. 184 or one course in modern diplomatic history at the 200 level or higher.

290. THEORIES OF POLITICS: THEIR CONTRIBUTIONS AND LIMITS I. 4 HOURS. Examination and evaluation of some classical and contemporary theories of politics and the implications such theories have for an understanding of contemporary politics and political action. Particular emphasis is given to the possibility of scientific theories of politics and to the place of value judgments in theory construction. The theories of Thucydides, Plato, Aristotle, Augustine, David Easton, S.M. Lipset, and Hans Morgenthau are discussed.

291. THEORIES OF POLITICS: THEIR CONTRIBUTIONS AND LIMITS II. 4 HOURS. Continues Political Science 290. Additional emphasis on deductive theories; John Locke and Rousseau. Aquinas, Machiavelli, Hobbes, Jacques Maritain, and Anthony Downs are also covered. Prerequisite: PolS. 290 or consent of the instructor.

292. THEORIES OF POLITICS: THEIR CONTRIBUTIONS AND LIMITS III. 4 HOURS. Continues Political Science 291. Additional emphasis on interest group theories, elitism, and liberalism. James Harrington, David Truman, Edmund Burke, Karl Marx, C. Wright Mills, John Stuart Mill, and Christian Bay are covered. Prerequisite: PolS. 290 or 291 or consent of the instructor.

297. AMERICAN POLITICAL THOUGHT. 4 HOURS. Survey of the political thought of the colonial, revolutionary, constitution-making, and Civil War periods; consideration of recent criticisms and defense of popular government as applied in the United States.

299. HONORS COURSE. 2 TO 4 HOURS. May be reelected for three quarters for a maximum of 10 hours. Open only to students majoring in political science. Independent reading and research. Prerequisites: Senior standing, University grade-point average of 4.000, and approval of the department.

301. EDUCATIONAL POLICY IN URBAN AMERICA. 4 HOURS. Same as Education 301. Examination of selected urban phenomena in relation to educational bureaucracies and school socialization processes. Emphasis on historical investigation of strategies for protest and change employed by ghetto populations; conditions which fostered these strategies; responses of schools and other target institutions; social-philosophical analysis of ideologies supporting both protest and response. Prerequisites: One course in the social foundations of education or the equivalent and consent of the instructor.

305. LOCAL POLITICAL DECISION MAKING. 4 HOURS. A research seminar. The problem of identifying and investigating political decisions in a major urban area like Chicago; an attempt is made to apply different theories of decision making to local politics. Prerequisites: PolS. 120 or 150 and consent of the instructor.

306. GHETTO POLITICS. 4 HOURS. Same as Black Studies 306. Analysis of the political impact of the ghetto on local, state, and national political systems; the impotency of the ghetto voter; the ghetto politician; ghetto riots as political protest; the ghetto and presidential politics. Prerequisite: Three courses in political science, American history, or sociology or consent of the instructor.

307. URBAN POLITICS SEMINAR. 4 HOURS. Analysis of the structure and dynamics of political parties and organizations in urban areas. Intensive study of the power structure, strength, and weakness of the Democratic and Republican parties in urban areas, using Chicago and its suburbs as a laboratory. Prerequisites: PolS. 205 and consent of the instructor.

311. STUDIES IN URBAN PUBLIC POLICIES. 4 HOURS. The problems of governing metropolitan areas; special emphasis on evolving patterns of cooperation among governments in metropolitan areas, such as metropolitan federalism, city-county consolidation, councils of governments, and regional planning commissions. Prerequisite: PolS. 120 or 205.

315. LEGISLATURES AND LEGISLATION. 4 HOURS. The legislative function in government; structure and organization of American legislatures, national, state, and local; party organization in legislatures; legislative procedure; pressure groups and lobbying; relation of the legislature to other branches of government; problems of legislative reorganization. Prerequisite: PolS. 120 or 150 or 151.

316. THE PRESIDENT AND CONGRESS. 4 HOURS. Analysis of the relationship of the President and Congress and of the problems involved in the formulation and execution of public policy. Prerequisite: PolS. 120 or 150 or 151.

317. INTERGOVERNMENTAL RELATIONS. 4 HOURS. The origin and evolution of the American federal system; federal-state constitutional relationships; intergovernmental fiscal relations; the political cultures; interstate relations; regionalism; state-local relations; interlocal relations and cooperative federalism in functional areas. Prerequisites: PolS. 150 or 151 and 205 or 212.

318. SCIENCE, TECHNOLOGY, AND PUBLIC POLICY. 4 HOURS. The impact of science and technology on governmental policy in the United States. Responses of the national executive and legislative branches of government; intergovernmental aspects of technological advances. Prerequisites: PolS. 150 or 151 and one advanced political science course or consent of the instructor.

319. THE PUBLIC ADMINISTRATION OF SCIENCE AND TECHNOLOGY. 4 HOURS. The response of public systems to the scientific and technological

revolution; the governmental institutions being devised to administer science and technology in the public sector. Emphasis on technological problems caused by the emergence of new metropolitan communities.

327. PUBLIC OPINION AND POLITICAL COMMUNICATION. 4 HOURS. The nature of public opinion and political communication systems; patterns of opinion distribution and techniques for opinion measurement; forces shaping public opinion, with emphasis on the mass media; the impact of public opinion on public policy; comparison of political communication patterns in the United States with less developed and totalitarian nations. Prerequisite: 6 hours of advanced political science, sociology, or modern history.

328. PROPAGANDA AND THE LANGUAGE OF POLITICS. 4 HOURS. The nature of propaganda, political symbols, and the languages of politics; the uses of political symbols and propaganda in the political processes of democratic and totalitarian societies; international propaganda and psychological warfare; methods and uses of propaganda analysis. Prerequisite: Two courses in advanced political science, sociology, or modern history.

331. ELECTORAL BEHAVIOR. 4 HOURS. Emphasizes two aspects of the study of electoral behavior: social, economic, and psychological theories developed specifically for, or adaptable to, the explanation of electoral behavior; introduction to inductive studies of voting behavior. Prerequisite: PolS. 130 or 230 or consent of the instructor.

332. QUANTITATIVE STUDY OF INTERNATIONAL POLITICS. 4 HOURS. The usefulness of statistical reasoning in making inferences about international politics. Political decision making, political conflict and cooperation, and political development and change in terms of three basic levels of analysis: multinational organization, nations, and international relations. Prerequisites: PolS. 184 and consent of the instructor.

334. POLITICAL SOCIALIZATION. 4 HOURS. Introduction to the problems of how people learn about the polity; from whom they learn, under what circumstances, and with what consequences. Prerequisite: Three courses in political science, including at least one dealing with human political behavior, or consent of the instructor.

336. FILM AS A RESEARCH TECHNOLOGY IN THE SOCIAL SCIENCES. 4 HOURS. The techniques and problems of film as a technology for generating, interpreting, and presenting data. Prerequisite: Consent of the instructor.

337. THE POLITICS OF ALIENATION. 4 HOURS. Conceptual, empirical, and normative analysis of alienation from polity, society, culture, and self. Focus on the political consequences of various forms of alienation, including radicalism, apathy, protest, revolution, renewal, and innovation. Empirical research is required. Prerequisite: PolS. 230.

341. POLITICAL CULTURE. 4 HOURS. Examination of attitudes, values, beliefs, and behavioral norms which characterize the political systems in the United States and other countries. Special problems, such as the nature of national identity, indicators of political cohesion, or determinants of political stability and instability may be emphasized. Prerequisite: PolS. 100 or 120 or 130 or 152. At least one 200-level course in comparative politics is recommended.

351. CONSTITUTIONAL LAW. 4 HOURS. Constitutional provisions and principles as they have developed through Supreme Court interpretation; the amending process; federalism; commerce, taxing, and war powers; due process of law; the constitutional relations between the three major branches of government. Prerequisite: At least one introductory political science course.

353. SEMINAR: PROBLEMS OF CONSTITUTIONAL LAW. 4 HOURS. Supervised individual study of selected problems arising in the interpretation of the United States Constitution. Prerequisites: PolS. 351 or 355 and consent of the instructor.

355. THE CONSTITUTION AND CIVIL LIBERTIES. 4 HOURS. The nature and constitutional positions of freedom of religion, speech, press, and others; varying interpretations of these freedoms; difficulties encountered in protecting them; problems of discrimination against racial, religious, and other minorities. Prerequisite: PolS. 150 or 151 or consent of the instructor.

356. ADMINISTRATIVE LAW. 4 HOURS. Legal problems arising in the relationships between the citizen and the government official; administrative rule making and enforcement; judicial review of administrative actions. Prerequisite: Consent of the instructor.

361. POLITICAL LEADERSHIP. 4 HOURS. Examination of contemporary political leadership and elites. Various approaches to, and theories about, political leadership in a variety of situational contexts, such as small groups, developing nations, revolutionary societies, complex political systems and organizations. Prerequisites: PolS. 100, 120, 130 or 150 and PolS. 230 or consent of the instructor.

362. SEMINAR: PUBLIC ADMINISTRATION. 4 HOURS. Supervised individual study of selected problems. Prerequisite: PolS. 261 or 263.

364. POLITICAL MODERNIZATION. 4 HOURS. The process of modernization in the United States and other countries; emphasis on the interaction between political and other factors, such as social change and economic growth; historical and contemporary patterns of political modernization and their problems. Prerequisites: PolS. 152 and one 200-level course in comparative politics.

370. PRACTICUM IN TEACHING POLITICAL SCIENCE. 4 HOURS. Provides seniors and graduate students with a limited exposure to teaching political science by leading discussion sections of undergraduate courses at the same time that they participate in a seminar on the problems and methods of teaching in the field. Teaching assistants may not receive credit for this course unless they actually teach discussion sections and are enrolled in this seminar. Prerequisites: Senior or graduate student major in political science, at least a B average in political science courses, and consent of the instructor.

381. SEMINAR: POLITICAL PROBLEMS OF DEVELOPING SOCIETIES. 4 HOURS. Same as Latin American Studies 381. Selected aspects of the politics of the countries of Asia, Africa, and Latin America. Prerequisite: PolS. 280.

385. WOMEN AND POLITICS: PROBLEMS IN POLICY ANALYSIS AND POLITICAL THEORY. 4 HOURS. The political, social, and economic participation of women in American society. Theories on the use of power, socialization, and psycho-biology as models in analyzing the outputs and outcomes of policies that affect women. Prerequisite: 8 hours of political science at the 200 or 300 level or consent of the instructor. Political Science 230 is recommended.

386. PROBLEMS IN INTERNATIONAL ORGANIZATION. 4 HOURS. May be repeated once for credit. Subject matter varies from quarter to quarter, but centers upon one group of related problems pertaining to the United Nations or other international organizations. Prerequisite: Two courses in international politics or international organization. Political Science 184 and 286 are recommended.

388. SEMINAR: PROBLEMS IN AMERICAN FOREIGN RELATIONS. 4 HOURS. Supervised individual study of selected problems of contemporary United States foreign relations. Prerequisite: PolS. 281 or 184 or consent of the instructor.

390. SCOPE AND METHODS OF POLITICAL SCIENCE. 4 HOURS. Examination of the scope and subject matter of political science. Special attention to analytic processes in the development of concepts, hypotheses, and theories. Methodologies and modes of analysis now in use by political scientists. Prerequisites: PolS. 100 or 120 or 151 and one 200-level course in political science.

391. POLITICAL POWER. 4 HOURS. Examination of the nature of political power. Introduction to some of the major literature of power, and the development of the concept of political power as a descriptive category adequate to the comparative analysis of broader political phenomena, such as parties, official decision-making structures and movements. Prerequisite: PolS. 120 or 150 and 4 hours of upper-division political science courses or consent of the instructor.

392. DEMOCRATIC THEORY. 4 HOURS. Democracy as a procedure of government and the value commitments associated with this form of government. Special attention is given to corporate wealth, special interests, bureaucracy, and the mass media as they affect the existence of democratic government.

395. TOPICS IN SOCIAL ORGANIZATION AND INSTITUTIONS. 4 HOURS. May be repeated for up to 12 hours of credit. Intensive analysis of a specialized topic. Prerequisites: 8 hours of upper-division sociology and consent of the instructor.

398. THE PROBLEM OF JUSTICE. 4 HOURS. Same as Criminal Justice 398. The premodern view of justice, such as Plato's or Aristole's; the modern understanding of justice, such as Hobbes' or Locke's, which is the foundation of the modern political regime; Rousseau's seminal political thought on justice, which is the basis of a variety of reforms and alternatives offered to Hobbes' and/or Locke's political regime. Prerequisite: Two courses in political science, including PolS. 150 or 151.

399. SEMINAR IN POLITICAL THEORY. 4 HOURS. May be repeated for a total of 8 hours. In-depth analysis and discussion of selected problems or works in political theory. Prerequisites: PolS. 290, 291, and 292 or consent of the instructor.

PORTUGUESE (Port)

100. INTENSIVE ELEMENTARY PORTUGUESE. 8 HOURS. Two additional hours per day in the language laboratory. Special accelerated course, equivalent to Portuguese 101 and 102.

101. ELEMENTARY PORTUGUESE I. 4 HOURS. Two additional half hours per week in the language laboratory. For students without credit in Portuguese. Oral practice, reading, and grammar.

102. ELEMENTARY PORTUGUESE II. 4 HOURS. Two additional half hours per week in the language laboratory. Continues Portuguese 101. Prerequisite: Port. 101 or the equivalent.

103. ELEMENTARY PORTUGUESE III. 4 HOURS. Two additional half hours per week in the language laboratory. Continues Portuguese 102. Prerequisite: Port. 102 or the equivalent.

104. INTERMEDIATE PORTUGUESE I. 4 HOURS. Two additional half hours per week in the language laboratory. Rapid reading, grammar review, composition, conversation. Prerequisite: Port. 103 or two years of high school Portuguese.

105. INTERMEDIATE PORTUGUESE II. 4 HOURS. Two additional half hours per week in the language laboratory. Continues Portuguese 104. Prerequisite: Port. 104 or the equivalent.

106. INTERMEDIATE PORTUGUESE III. 4 HOURS. Two additional half hours per week in the language laboratory. Continues Portuguese 105. Prerequisite: Port. 105 or the equivalent.

110. INTENSIVE ELEMENTARY/INTERMEDIATE PORTUGUESE. 8 HOURS. Two additional hours per week in the language laboratory. Continues Portuguese 100. Special accelerated course; work is equivalent to that in Portuguese 103 and 104 combined. Prerequisite: Port. 100 or 102 or the equivalent.

120. INTENSIVE INTERMEDIATE PORTUGUESE. 8 HOURS. Two additional hours per week in the language laboratory. Continues Portuguese 110. Special accelerated course; work is equivalent to that in Portuguese 105 and 106 combined. Prerequisite: Port. 110 or 104 or the equivalent.

170. MASTERPIECES OF LUSO-BRAZILIAN LITERATURE IN ENGLISH TRANSLATION. 4 HOURS. May be repeated for credit each quarter topics change. Same as Humanities 170 and Latin American Studies 170. Representative works with background material.

171. READINGS IN LUSO-BRAZILIAN CULTURE IN ENGLISH TRANSLATION. 4 HOURS. Same as Humanities 171 and Latin American Studies 171. Selected topics. May be repeated for credit each quarter topics change.

172. PORTUGUESE LITERATURE IN ENGLISH TRANSLATION. 4 HOURS. Same as Humanities 172. Introduction to the Portuguese literary tradition. Reading and discussion of major literary movements, individual works, and such literary figures as Gil Vicente, Camões, Eça de Queiroz, and Fernando Pessoa. Prerequisites: Port. 170 and 171 or consent of the instructor.

205. PORTUGUESE LITERATURE I. 4 HOURS. Survey to 1800. Prerequisite: Two years of Portuguese or the equivalent or consent of the instructor.

206. PORTUGUESE LITERATURE II. 4 HOURS. Survey from 1800 to the present. Prerequisite: Port. 205 or consent of the instructor.

215. BRAZILIAN LITERATURE I. 4 HOURS. Survey through Romanticism. Prerequisite: Two years of Portuguese or the equivalent or consent of the instructor.

216. BRAZILIAN LITERATURE II. 4 HOURS. Survey from realism and naturalism to the present. Prerequisite: Port. 215 or consent of the instructor.

217. LUSO-BRAZILIAN CULTURE I. 4 HOURS. Readings and discussions in Portuguese and English related to an understanding of *a realidade brasileira.* Prerequisite Port. 219 or consent of the instructor.

218. LUSO-BRAZILIAN CULTURE II. 4 HOURS. Continues Portuguese 217. Prerequisite: Port. 217 or consent of the instructor.

219. RAPID PORTUGUESE FOR SPEAKERS OF SPANISH. 4 HOURS. For students with a fluent knowledge of Spanish. Concentration on the comparative linguistic differences between Spanish and Portuguese and practice in speaking, reading, and writing. Prerequisites: Native Spanish and two 200-level Spanish courses or consent of the instructor.

290. TOPICS IN LUSO-BRAZILIAN STUDIES. 4 HOURS. Literature, linguistics and culture. Prerequisite: Consent of the instructor.

299. INDEPENDENT STUDY. 1 TO 6 HOURS. May be repeated for credit. Open to qualified students interested in Luso-Brazilian studies. Prerequisites: Proficiency in Portuguese and approval of the department.

399. INDEPENDENT STUDY. 1 TO 6 HOURS. May be repeated for credit. Intended for graduate students who wish to research various aspects of Luso-Brazilian studies on an independent basis. Prerequisite: Consent of the instructor.

PSYCHOLOGY (Psch)

100. INTRODUCTION TO PSYCHOLOGY I. 4 HOURS. Survey of the basic concepts of contemporary psychology in those areas of the field that emphasize man as a biological organism. Participation in actual research.

101. INTRODUCTION TO PSYCHOLOGY II. 4 HOURS. Survey of the basic concepts of contemporary psychology in those areas of the field that emphasize complex cognitive and social processes. Participation in actual research is provided. Prerequisite: Credit or concurrent registration in Psch. 100.

104. THE PROFESSION OF PSYCHOLOGY. 4 HOURS. Introduction to psychology as a profession in modern society; clinical psychology as a profession in modern society; clinical practice, applications of psychology in work environments, and the influence of psychology on public policy. Prerequisite: Psch. 101.

143. INTRODUCTION TO RESEARCH IN PSYCHOLOGY. 4 HOURS. Techniques and problems associated with the study of behavior. Emphasis on measurement, descriptive statistics, and the principles of experimental design. Exercises involving data collection. Prerequisite: Psch. 101.

210. PSYCHOLOGY OF PERSONALITY. 4 HOURS. Systematic study of the development, dynamics, and structure of personality; methodology, theory, and empirical research. Prerequisite: Psch. 143.

215. PSYCHOLOGY OF ATTITUDE AND OPINION. 5 HOURS. Individual readings and projects are assigned. Same as Speech and Theater 215. Survey of behavioral approaches to the measurement of social attitudes and opinions; determinants and correlates of public attitudes and opinions. Lecture and participation in field and laboratory studies. Prerequisite: 8 hours of psychology or consent of the instructor.

220. PSYCHOLOGY OF CHILDHOOD AND ADOLESCENCE. 4 HOURS. Development of behavior in infancy, childhood, and youth. Emphasis on learning, motivational, and biosocial factors. Prerequisite: Psch. 143.

221. CHILD GROWTH AND DEVELOPMENT. 4 HOURS. Growth and development in infancy, childhood, and adolescence; emphasis on genetic, constitutional, and organic determinants in relation to environmental factors, particularly in early stages. Prerequisite: 8 hours of psychology or consent of the instructor.

222. PSYCHOLOGY OF ADULTHOOD AND OLD AGE. 4 HOURS. Determinants of adjustment in marriage, educational and vocational pursuits, retirement, and old age; emphasis on learning, motivational, and biosocial factors. Prerequisite: 8 hours of psychology or consent of the instructor.

224. EDUCATIONAL PSYCHOLOGY. 4 HOURS. Basic undergraduate course in the psychology of education. Facts and principles of physical growth and development, learning, concept formulation, acquired motivation, and achievement testing applied to the classroom situation. Prerequisite: Psch. 143.

230. PSYCHOLOGY IN BUSINESS AND INDUSTRY. 4 HOURS. Application of the methods and findings of psychology to the study of people at work. Emphasis on problems of personnel selection, training, work methods, safety, motivation, labor-management relations, counseling, and related topics. Prerequisite: Psch. 143.

240. INTRODUCTION TO PSYCHOLOGICAL TESTING. 4 HOURS. Introduction to the principles of psychological testing, with a survey of representative techniques. Emphasis on concepts of objectivity, reliability, and validity. Lectures and conference sections. Prerequisite: Psch. 143.

243. STATISTICAL METHODS IN BEHAVIORAL SCIENCE. 4 HOURS. Credit is not given for Psychology 243 if the student has credit in Quantitative Methods 271. Introduction to statistical inference: probability distributions, sampling, hypothesis testing, and analysis of variance and nonparametric techniques. Emphasis on analysis of data from psychological research. Lectures and laboratory. Prerequisites: Psch. 143 and consent of the instructor.

247. DIFFERENTIAL PSYCHOLOGY. 4 HOURS. The nature, determinants, and correlates of individual and group differences in behavior. Prerequisite: Psch. 143.

250. LECTURES IN PERCEPTION. 4 HOURS. Survey of theories and empirical findings in the study of sensation and perception. Emphasis on the contribution of experimental psychology to understanding the subjective experience of the physical environment. Prerequisite: Psch. 143.

251. LECTURES IN LEARNING. 4 HOURS. Principles of learning; emphasis on parameters of acquisition, extinction, and retention in basic learning paradigms. Prerequisite: Psch. 143.

252. LECTURES IN THE PSYCHOLOGY OF THINKING. 4 HOURS. Critical survey of experimental findings in verbal learning, problem solving, psycholinguistics, and conceptual behavior. Prerequisite: Psch. 143.

255. LECTURES IN SOCIAL PSYCHOLOGY. 4 HOURS. Credit is not given for Psychology 255 if the student has credit in either Sociology 110 or 210. Survey of research and theory in representative areas of social psychology, including

conformity, attitude development and change, social perception, conflict resolution, and group decision making. Emphasis on experimental investigation of behavior in social settings. Prerequisite: Psch. 143.

256. LECTURES IN PHYSIOLOGICAL PSYCHOLOGY. 4 HOURS. Research and theory concerned with the physiological bases of behavior. Understanding of basic brain organization and function is stressed; special emphasis on neural mechanisms of attention, emotion, motivation, and learning. Prerequisite: Psch. 143.

260. LABORATORY COURSE IN PERCEPTION. 4 HOURS. Laboratory practicum in sensation and perception. Prerequisites: Psch. 243, 250, and consent of the instructor.

261. LABORATORY COURSE IN LEARNING. 4 HOURS. Laboratory practicum in conditioning and simple learning; emphasis on the effects of motivational level and reinforcement contingencies. Prerequisites: Psch. 243, 251, and consent of the instructor.

262. LABORATORY COURSE IN THE PSYCHOLOGY OF THINKING. 4 HOURS. Laboratory practicum in verbal learning, psycholinguistics, problem solving, and conceptual behavior. Prerequisites: Psch. 243, 252, and consent of the instructor.

265. LABORATORY COURSE IN SOCIAL PSYCHOLOGY. 4 HOURS. Laboratory practicum in social learning and perception, power and influence, and other aspects of social behavior. Prerequisites: Psch. 243, 255, and consent of the instructor.

266. LABORATORY COURSE IN PHYSIOLOGICAL PSYCHOLOGY. 4 HOURS. Laboratory practicum; emphasis on research techniques of physiological psychology and the physiological correlation of behavior. Prerequisites: Psch. 243, 256, and consent of the instructor.

268. LABORATORY IN DEVELOPMENTAL PSYCHOLOGY. 4 HOURS. Survey of dominant research strategies used in contemporary developmental psychology; laboratory experience in developmental research. Occasional field work off campus. Prerequisites: Psch. 220 or 221; Psch. 243.

280. ABNORMAL PSYCHOLOGY. 4 HOURS. Forms and determination of behavior and personality disorders. Prerequisite: Psch. 210.

285. FIELD WORK IN APPLIED PSYCHOLOGY. 4 HOURS. May be repeated for a total of 8 hours. Supervised practicum as a volunteer worker for a minimum equivalent of one day per week in a mental hospital, clinic, or half-way house. Prerequisites: 12 hours of psychology, consent of the instructor, and approval of the mental health institution or agency involved.

291. TUTORIAL IN PSYCHOLOGY. 2 TO 4 HOURS. May be repeated for a total of 8 hours. Seminar devoted to a preannounced topic suggested by students or faculty members. Suggestions for topics should be submitted in writing to the department office. Prerequisites: Psch. 143 and consent of the instructor.

299. INDEPENDENT RESEARCH. 2 TO 6 HOURS. May be repeated for a maximum of 18 hours. Individual research investigation of a special problem under direction of a staff member. Prerequisites: Psch. 243, 4.000 grade-point average, consent of the instructor, and consent of the head of the department.

312. PERSON PERCEPTION. 4 HOURS. Analysis of theory and research on the perception and evaluation of persons in social settings, with emphasis on role theory, attribution, and social comparison processes. Applications to dynamics of interpersonal attraction, affiliation, and influence in experimental and natural settings. Prerequisites: Graduate standing or Psch. 265 and consent of the instructor.

313. SOCIAL JUDGMENT. 4 HOURS. Analysis of the judgment process and its implications for social psychological phenomena. Prerequisites: Psch. 265 and consent of the instructor.

314. ATTITUDE CHANGE. 4 HOURS. Critical analysis of selected contemporary theory and research on attitude change. Topics include source and message effects, determinants of persistence of change and resistance to change. Prerequisites: Psch. 265 and consent of the instructor.

315. COGNITIVE CONSISTENCY PROCESSES. 4 HOURS. Critical analysis of research and theory related to the processes of information integration and its implications for attitude and opinion change. Emphasis on cognitive consistency formulations and their derivatives. Prerequisites: Psch. 265 and consent of the instructor.

316. ANIMAL BEHAVIOR. 4 HOURS. Principles and methods in the study of animal behavior; review of the social behavior of representative species in various phyla. Prerequisites: BioS. 100, 101, 102, and Psch. 143 or consent of the instructor.

323. PSYCHOLOGY OF THE EXCEPTIONAL CHILD. 4 HOURS. Methods, results, and interpretation of studies of physically, intellectually, and emotionally deviant children; special reference to their implications for education and behavior modification. Prerequisite: 12 hours of psychology, including Psch. 220 or the equivalent, or consent of the instructor.

330. ORGANIZATIONAL PSYCHOLOGY. 4 HOURS. Same as Management 330. Individual and psychological processes and their interaction with organizational structure. Behavioral factors in effective organizational change. Prerequisites: Psch. 243, one course in social psychology or industrial psychology, and consent of the instructor.

332. PERSONNEL PSYCHOLOGY. 4 HOURS. Systematic study of the development and utilization of psychological techniques of personnel selection, classification, and assessment. Prerequisites: Psch. 240, 243, and consent of the instructor.

333. MOTIVATION AND MORALE IN ORGANIZATIONS. 4 HOURS. Same as Management 333. Concepts and methods in the assessment and modification of motivation, attitudes, and morale. Prerequisites: 12 hours of psychology, including Psch. 330, and consent of the instructor.

335. PSYCHOLOGY OF INDUSTRIAL TRAINING. 4 HOURS. Same as Management 335. Psychological measurement techniques in assessing training needs and evaluating training effectiveness. Application of psychological techniques to the development of industrial training programs. Prerequisite: Psch. 332 or the equivalent.

338. PSYCHOLOGY OF INDUSTRIAL CONFLICT. 4 HOURS. Same as Management 338. Behavioral analysis of the causes, dimensions, and modes of resolution of industrial conflict; special emphasis on labor-management relations. Prerequisite: Psch. 330 or the equivalent.

343. ADVANCED STATISTICS I. 4 HOURS. Elementary probability theory, empirical and theoretical distributions, points and interval estimation, hypothesis testing. Prerequisites: Psch. 243 and consent of the instructor.

345. PSYCHOMETRIC APPLICATIONS. 4 HOURS. Theory of psychological tests and measurement applied to problems of ability and personality testing; opinion sampling; reliability and validity; prediction and selection processes: Prerequisites: Psch. 243 and consent of the instructor.

350. LEARNING AND CONDITIONING. 4 HOURS. Methods, results, and interpretation of experimental studies of basic learning processes in animal and human subjects. Prerequisites: Psch. 261 and consent of the instructor.

351. PROGRAMMED LEARNING. 4 HOURS. Theory and research in the techniques, applications, and results of programmed instruction. Prerequisites: Psch. 224 and consent of the instructor.

352. MOTIVATION. 4 HOURS. Methods, results, and interpretation of experimental studies of basic motivational processes in animal and human subjects. Prerequisites: Psch. 261 or 266 and consent of the instructor.

353. OPERANT CONDITIONING. 4 HOURS. Survey of basic principles and current research in the area of operant behavior. Prerequisite: Consent of the instructor.

354. THE PSYCHOLOGY OF LANGUAGE. 4 HOURS. Same as Linguistics 374 and Speech and Theater 354. Introductory survey of methods, theory, and research; acquaints students with the history and present status of psychology's interest in language behavior. Prerequisite: Consent of the instructor.

355. HIGHER PROCESSES. 4 HOURS. Methods, results, and interpretations of experimental studies of language behavior, problem solving, concept formation, and creativity. Prerequisite: Consent of the instructor.

356. SENSORY AND PERCEPTUAL PROCESSES I. 4 HOURS. Methods, results, and interpretation of experimental studies dealing with the determination of psycho-physical functions. Primary emphasis on the perception of single discrete stimuli and attributes of stimuli. Prerequisites: Psch. 250 and consent of the instructor.

357. SENSORY AND PERCEPTUAL PROCESSES II. 4 HOURS. Methods, results, and interpretation of experimental studies dealing primarily with the role of contextual and experimental factors in perception. Prerequisites: Psch. 250 and consent of the instructor.

360. HUMAN FACTORS. 4 HOURS. Application of experimentally derived principles of behavior to the design of equipment for efficient use and operation. Sensory and perceptual processes, motor skills, and experimental methodology. Prerequisite: 12 hours of psychology, including Psch. 250 and 251 or the equivalents, or consent of the instructor.

361. INSTRUMENTATION IN PSYCHOLOGY. 4 HOURS. Use of transducers, programming equipment, and recording systems in psychological research. Prerequisite: Consent of the instructor.

362. PHYSIOLOGICAL PSYCHOLOGY. 4 HOURS. Methods, results, and interpretation of experimental studies of physiological and neurochemical

correlates of learning, motivation, and perception. Laboratory demonstrations and problems. Prerequisites: 12 hours of psychology, including Psch. 256 or the equivalent, and consent of the instructor.

363. BEHAVIORAL PHARMACOLOGY. 4 HOURS. Methods, results, and interpretation of experimental studies dealing with drugs and behavior. Emphasis on elucidating the role of drugs as tools in behavioral research and on the use of experimental psychology techniques to explicate drug action. Prerequisites: Psch. 251, 256, and consent of the instructor.

370. SYSTEMS AND THEORIES. 4 HOURS. Critical introductory analysis of major historical systems and their representation in current theoretical issues. Prerequisites: Psch. 250, 251, and consent of the instructor.

382. INTRODUCTION TO CLINICAL PSYCHOLOGY. 4 HOURS. Systematic analysis of the nature of psychological tests and their application; introduction to intelligence, achievement, personality, and interest tests. Practice in administration and interpretation. Prerequisites: Psch. 243 or the equivalent and consent of the instructor.

399. PROBLEMS IN PSYCHOLOGY. 2 TO 12 HOURS. May be repeated for a total of 12 hours. Individual research investigation of special problems under the direction of a staff member. Prerequisites: Consent of the instructor and approval of the head of the department.

QUANTITATIVE METHODS (QM)

270. STATISTICS I. 4 HOURS. The role of statistics in the scientific approach to decision making. Data sources, accuracy, precision. The concepts of average and dispersion as applied to samples and universes. Emphasis on modern aids to problem solving. Prerequisites: Math. 110, 111, and 112.

271. STATISTICS II. 4 HOURS. The nature and contributions of probability theory to the study of decision making under uncertainty. Probability distributions; sampling distributions. Concept and measurement of precision for pertinent statistics. Nonparametric statistics and their use in decision making. Prerequisite: QM 270.

272. STATISTICS III. 4 HOURS. Two and higher dimensional considerations, regression analysis, time series, models, precision, strategy. Prerequisite: QM 271.

275. DATA PROCESSING USING COBOL. 4 HOURS. Electronic data processing; COBOL as a programming language; applications of COBOL to industrial and governmental problems. Prerequisite: QM 272 or Math. 194 or 195 or consent of the instructor.

369. MULTIVARIATE ANALYSIS I. 4 HOURS. Introduction to the structure and analysis of multivariate data, using the multivariate normal model. The relevant matrix theory; multilinear regression; tests concerning multivariate means; multivariate analysis of variance. Prerequisite: QM 272 or consent of the instructor.

370. MULTIVARIATE ANALYSIS II. 4 HOURS. Multivariate techniques of data analysis in common use. Topics include principal components, factor analysis, canonical correlation, discriminant analysis classification procedures.

371. SURVEY RESEARCH. 4 HOURS. Application of sampling theory and methods to planning, conducting, and evaluating surveys for measuring public opinion, consumer attitudes, and preferences. Instruments of measurement, sample design estimation, sources of errors and bias. Case studies with application to actual situations. Prerequisite: QM 272 or the equivalent.

373. ANALYSIS OF VARIANCE AND EXPERIMENTAL DESIGN. 4 HOURS. General theory of design and analysis of experiments. Least squares estimation, multiple regression, analysis of variance, randomization, randomized blocks, Latin squares, factorial designs, replication, incomplete blocks. Prerequisite: QM 272 or consent of the instructor.

375. INFORMATION SYSTEMS. 4 HOURS. An introduction to the theory and concepts of systems, including classification, deterministic and probabilistic models, Markov processes and Monte Carlo techniques, simulation. Introduction to the models as related to the computer; types of programming; experimentation and evaluation. Prerequisite: QM 272 or consent of the instructor. Math. 194 or 195 is recommended.

376. SURVEY OF OPERATIONS RESEARCH. 4 HOURS. Methods, techniques, and applications; linear programming, simulation, production and inventory theory, queuing theory, game theory. Prerequisites: Math. 112 and QM 272.

378. DYNAMIC PROGRAMMING. 4 HOURS. Theory and application to solving problems in multistage decision processes arising in a wide variety of fields such as operations research, engineering, and mathematics. Deterministic and random processes are considered, and computational and analytical methods of solution derived. Prerequisites: Math. 133 and 220 or the equivalents.

399. INDEPENDENT STUDY IN QUANTITATIVE METHODS. 1 TO 4 HOURS. May be repeated for a total of 12 hours. Intensive study of selected topics to be determined in consultation with the instructor and department head. Prerequisites: Major in quantitative methods and consent of the department head.

RELIGIOUS STUDIES (RelS)

214. PHILOSOPHY OF RELIGION. 4 HOURS. Same as Philosophy 214. Philosophical inquiry into the grounds of religious belief and the character of religious experience. Prerequisite: One course in philosophy.

225. NON-WESTERN RELIGIONS. 4 HOURS. Same as Anthropology 225. Exploration of the varieties of religious experience, including magic and witchcraft; the roles of priesthood, prayers, scriptures, and ceremonials in social integration; the nature of sectarian movements. Prerequisite: 4 hours of either anthropology, psychology, or sociology or consent of the instructor.

235. STUDIES IN EXISTENTIALIST LITERATURE. 4 HOURS. Same as Humanities 235 and Philosophy 235. Imaginative works by Dostoevsky, Rilke, Kafka, Sartre, and Camus; selections from Pascal, Kierkegaard, Nietzsche, Jaspers, and Tillich. Prerequisite: Junior standing or consent of the instructor.

246. THE SOCIOLOGY OF RELIGION. 4 HOURS. Same as Sociology 246. Analysis of the structures and functions of religious institutions, particularly as found in modern society. Special attention to the interplay between religion and other social phenomena, such as economics and politics; the social-psychological aspects

of religious behavior; current trends in religious institutions. Prerequisite: Soc. 100.

248. MYTHOLOGY OF GREECE. 4 HOURS. Same as Classics 248 and Humanities 248. Intensive study of the gods and heroic sagas of the Greeks through original sources in translation.

272. GREEK RELIGION. 4 HOURS. Same as Classics 272. Greek religious practice and thought from Mycenean to Hellenistic times.

273. THE BIBLE AS LITERATURE I: THE OLD TESTAMENT. 4 HOURS. Same as Humanities 273. Historical and analytical study of the Old Testament portion of the English Bible; concentration on the King James Version, with attention to more recent revisions of that version. Prerequisite: Junior standing or consent of the instructor.

274. THE BIBLE AS LITERATURE II: THE APOCRYPHA AND THE NEW TESTAMENT. 4 HOURS. Same as Humanities 274. Historical and analytical study of the Apocrypha and New Testament portions of the English Bible; concentration on the King James Version, with attention to more recent revisions of that version. Prerequisite: Junior standing or consent of the instructor.

282. ROMAN RELIGION. 4 HOURS. Same as Classics 282 and Humanities 282. Beliefs, practices, and institutions of Roman religion and cults from the early republic to A.D. 476.

291. HONORS SEMINAR ON RELIGIOUS STUDIES. 4 HOURS. Variable content depending upon the instructor. A sincere interest in religious studies is requisite. Prerequisite: James Scholar or other honors designation approved by the University Honors Program.

295. STUDENT-INITIATED COURSE IN RELIGIOUS STUDIES. 2 TO 4 HOURS. For students who assume the initiative of requesting instruction in some aspect of religious studies not offered in any other course. Prerequisite: Consent of the Chairman of the Committee on Religious Studies.

299. SPECIAL TOPICS IN RELIGIOUS STUDIES. 1 TO 5 HOURS. May be repeated; however, only 8 hours may be applied toward the completion of the religious studies minor requirement. Independent reading, study, or research for students who have officially declared a minor in religious studies. Prerequisite: Officially declared minor in religious studies.

306. TOPICS IN MEDIEVAL HISTORY. 4 HOURS. May be repeated for credit. Same as History 306. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.

312. GEOGRAPHY OF RELIGIONS. 4 HOURS. Same as Geography 312. Systematic treatment of geographical manifestations of the major religious systems of the world. Special attention to the geographical origins and dispersal mechanisms of religious systems and to the manner in which man organizes his life within the framework of his belief. Intensive study of applications being made in the geographical inquiry of religious systems. Prerequisites: Geog. 190 and 210.

313. THE CLAIMS OF SCIENCE AND RELIGION. 4 HOURS. Same as Philosophy 313. Convergence and conflict between the results of science and the claims of religion; similarities and differences between their methods of inquiry. Prerequisites: RelS. 214 and one course in philosophy.

315. COMPARATIVE RELIGIOUS MOVEMENTS. 4 HOURS. Same as Anthropology 315. Analysis of religious behavior; special reference to the emergence of messianic cults in Africa and Melanesia and among the North American Indians and New World Negroes. Prerequisites: Junior standing, 8 hours of social anthropology or 8 hours of sociology, and consent of the instructor.

395. TOPICS IN RELIGIOUS HISTORY. 4 HOURS. May be repeated for credit. Same as History 395. Specific topics are announced each quarter. Prerequisite: 4 hours of history or consent of the instructor.

RHETORIC. See English Composition.

RHETORIC FOR FOREIGN STUDENTS. See English Composition.

RUSSIAN (Russ)

101. ELEMENTARY RUSSIAN I. 4 HOURS. Four additional half hours per week in the language laboratory. For students who have had no work in Russian.

102. ELEMENTARY RUSSIAN II. 4 HOURS. Four additional half hours per week in the language laboratory. Continues Russian 101. Prerequisite: Russ. 101 or the equivalent.

103. ELEMENTARY RUSSIAN III. 4 HOURS. Four additional half hours per week in the language laboratory. Continues Russian 102. Prerequisite: Russ. 102 or the equivalent.

104. ELEMENTARY RUSSIAN IV. 4 HOURS. Four additional half hours per week in the language laboratory. Continues Russian 103. Prerequisite: Russ. 103 or the equivalent.

111. INTENSIVE ELEMENTARY RUSSIAN I. 8 HOURS. Three additional hours per week in the language laboratory. For students who have had no work in Russian. Intensive elementary course which combines the material in Russian 101 and 102.

112. INTENSIVE ELEMENTARY RUSSIAN II. 8 HOURS. Three additional hours per week in the language laboratory. Intensive elementary course which combines the material in Russian 103 and 104. Prerequisite: Russ. 111 or the equivalent.

115. INTENSIVE RUSSIAN READING I. 8 HOURS. Intensive elementary course for those students seeking reading ability in scientific or technical material in the humanities, social sciences, and natural sciences. Morphology, basic syntax, reading of texts, and the mechanics of translating from Russian.

116. INTENSIVE RUSSIAN READING II. 8 HOURS. Continues Russian 115. Prerequisite: Russ. 115.

121. INTERMEDIATE RUSSIAN I. 4 HOURS. Four additional half hours per week in the language laboratory. Continues Russian 104. Prerequisite: Russ. 104 or 112 or 116 or the equivalent

122. INTERMEDIATE RUSSIAN II. 4 HOURS. Four additional half hours per week in the language laboratory. Continues Russian 121. Prerequisite: Russ. 121 or the equivalent.

131. RUSSIAN READING III. 4 HOURS. Continues Russian 116. Intermediate course for those students seeking reading ability in scientific or technical material in the various sciences. Prerequisite: Russ. 116 or 104 or 112.

132. RUSSIAN READING IV. 4 HOURS. Continues Russian 131. Prerequisite: Russ. 131.

201. SPEAKING AND WRITING RUSSIAN I. 4 HOURS. Conversation and composition, systematic grammar, vocabulary development, aural comprehension. Prerequisite: Russ. 122 or the equivalent.

202. SPEAKING AND WRITING RUSSIAN II. 4 HOURS. Continues Russian 201. Prerequisite: Russ. 201 or the equivalent.

203. SPEAKING AND WRITING RUSSIAN III. 4 HOURS. Continues Russian 202. Prerequisite: Russ. 202.

204. CORRECTIVE RUSSIAN PHONETICS. 4 HOURS. Pronunciation and intonation practice based on the theoretical understanding of acoustic and articulating phonetics as they pertain to Russian. Prerequisite: Russ. 122 or the equivalent.

207. THE TEACHING OF RUSSIAN IN THE SECONDARY SCHOOL. 4 HOURS. Modern techniques, including the language laboratory. Prerequisite: Russ. 203 or consent of the instructor.

215. MAIN CURRENTS OF RUSSIAN THOUGHT I. 4 HOURS. Literary, philosophical, and theological works, from the beginning to 1725; structured to acquaint the student with the main cultural forces that shaped Russian thought and manners. Given in English. Prerequisite: Junior standing or consent of the instructor.

216. MAIN CURRENTS OF RUSSIAN THOUGHT II. 4 HOURS. Continues Russian 215. Covering the period from 1725 to the October Revolution of 1917. Given in English. Prerequisite: Junior standing or consent of the instructor.

221. INTRODUCTION TO RUSSIAN LITERATURE I. 4 HOURS. Same as Humanities 231. Russian literature from 988 to 1830. Prerequisite: Junior standing or consent of the instructor.

222. INTRODUCTION TO RUSSIAN LITERATURE II. 4 HOURS. Same as Humanities 232. Prose fiction from 1830 to 1880. Prose and poetry from 1880 to 1905. Special attention to the works of Pushkin, Lermontov, Gogol, Turgenev, Dostoevsky, and Tolstoy and to the "aesthetic revival" after 1890. Prerequisite: Junior standing or consent of the instructor.

223. INTRODUCTION TO RUSSIAN LITERATURE III. 4 HOURS. Same as Humanities 233. Twentieth century literature from 1905 to the present; special attention to Gorky, Bunin, Sholokhov, Pasternak, and others. Prerequisite: Junior standing or consent of the instructor.

230. STUDIES IN THE RUSSIAN SHORT STORY. 4 HOURS. The Russian short story as a literary form. Close readings of selected short stories of the nineteenth century masters. Prerequisite: Junior standing or consent of the instructor.

260. RUSSIAN FOR THE SCIENTIST. 4 HOURS. May not be taken to fulfill foreign language graduation requirements. An accelerated course in the structure of Russian. Morphology, basic syntax, reading texts, and the mechanics of translating from Russian. For those seeking reading ability in technical material in the humanities, social sciences, or natural sciences. Prerequisite: Junior standing.

299. INDEPENDENT STUDY. 1 TO 6 HOURS. May be repeated for credit. Prerequisites: Russ. 122 or the equivalent and approval of the department.

301. ADVANCED RUSSIAN CONVERSATION AND COMPOSITION I. 4 HOURS. The development of oral and writing skills: vocabulary building, style development. Aural comprehension practice. Prerequisite: Russ. 203 or the equivalent.

302. ADVANCED RUSSIAN CONVERSATION AND COMPOSITION II. 4 HOURS. Continues Russian 301. Prerequisite: Russ. 301 or the equivalent.

303. ADVANCED RUSSIAN CONVERSATION AND COMPOSITION III. 4 HOURS. Continues Russian 302. Prerequisite: Russ. 302 or the equivalent.

307. METHODOLOGICAL PROBLEMS IN RUSSIAN INSTRUCTION. 4 HOURS. Analysis and discussion of special methodological problems connected with the teaching of Russian. Prerequisite: Russ. 203 or the equivalent.

308. RUSSIAN APPLIED LINGUISTICS FOR TEACHERS. 4 HOURS. Classroom application of linguistic principles and techniques. Prerequisite: Russ. 203 or the equivalent.

320. RUSSIAN POETRY I. 4 HOURS. Major poets from 1700 to 1840: Lomonosov, Derzhavin, Krylov, Pushkin, and others. Prerequisite: 24 hours of Russian or consent of the instructor.

321. RUSSIAN POETRY II. 4 HOURS. Major poets from 1840 to the 1890's: Zhukovsky, Batyushkov, Lermontov, Nekrasov, Tyutchev, Fet, and others. Prerequisite: 24 hours of Russian or consent of the instructor.

322. RUSSIAN POETRY III. 4 HOURS. Major poets from the 1890's to the present: Bely, Blok, Akhmatova, Mandelshtam, Yesenin, Mayakovsky, Pasternak, Yevtushenko, Voznesensky, and others. Prerequisite: 24 hours of Russian or consent of the instructor.

324. STUDIES IN RUSSIAN LITERARY CRITICISM. 4 HOURS. Belinsky, Chernyshevsky, Herzen, Dobrolyubov, Pisarev, L.N. Tolstoy. Prerequisite: Russ. 224.

332. PROBLEMS IN RUSSIAN GRAMMAR. 4 HOURS. May be repeated once for credit. Required for Russian teaching majors. Intensive study and review of problems of Russian grammar and syntax. Prerequisite: Russ. 201 or consent of the instructor.

350. RUSSIAN NOVEL I. 4 HOURS. Historical and critical study of the development of the Russian novel from 1800 to about 1860: Pushkin, Lermontov, Gogol,

Goncharov, Chernyshevsky. Prerequisite: Junior standing or consent of the instructor.

351. RUSSIAN NOVEL II. 4 HOURS. Continues Russian 350. Development from 1860 to about 1900: Turgenev, Saltykov-Shchedrin, L.N. Tolstoy, Dostoevsky. Prerequisite: Junior standing or consent of the instructor.

352. RUSSIAN NOVEL III. 4 HOURS. Continues Russian 351. Development from 1900 to the present: Gorky, Zamyatin, Sholokhov, A.N. Tolstoy, Ehrenburg, Pasternak, Bulgakov, Solzhenitsyn. Prerequisite: Junior standing or consent of the instructor.

360. SURVEY OF RUSSIAN DRAMA. 4 HOURS. Major authors from the beginning of the Enlightenment to the end of the nineteenth century: Fonvizin, Griboedov, Pushkin, Gogol, Turgenev, Ostrovsky, L.N. Tolstoy, Chekhov, Gorky. Prerequisite: Slav. 224 or Spch. 122 or consent of the instructor.

361. TWENTIETH CENTURY RUSSIAN DRAMA. 4 HOURS. Major authors: Gorky, Andreev, Bulgakov, Mayakovsky, and others. Prerequisite: Slav. 224 or Spch. 122 or consent of the instructor.

399. INDEPENDENT STUDY. 1 TO 4 HOURS. Investigation of special problems under the general direction of a staff member. Prerequisite: Consent of the instructor and the head of the department.

SLAVIC LANGUAGES AND LITERATURES (Slav)

215. UKRAINIAN CULTURE AND CIVILIZATION. 4 HOURS. Literary, philosophical, and artistic endeavor in the Ukraine from the Slav Settlement to the present. The main cultural forces that shaped Ukrainian thought and nationality. Prerequisite: Junior standing or consent of the instructor.

224. METHODS OF LITERARY ANALYSIS. 4 HOURS. Selected masterpieces of Slavic literature analyzed from the structural, thematic, historical, psychological/sociological, biographical, and linguistic points of view. Prerequisite: Junior standing or consent of the instructor.

245. MASTERPIECES OF UKRAINIAN LITERATURE. 4 HOURS. Survey of the Ukrainian literary scene from Kotlarewsky to the Revolution. Prerequisite: Junior standing or consent of the instructor.

270. EDUCATIONAL PRACTICE WITH SEMINAR I. 8 HOURS. Same as Education 270. The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Ed. 250, admission to advanced standing, and recommendation of the department of specialization.

271. EDUCATIONAL PRACTICE WITH SEMINAR II. 8 HOURS. Same as Education 271. The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Ed. 250, credit or concurrent registration in Slav. 270, admission to or continuation of advanced standing, and recommendation of the department of specialization.

277. STRUCTURE OF UKRAINIAN. 4 HOURS. Comparative study of Ukrainian and

other Eastern European Slavic languages; emphasis on the differences in their phonology, morphology, and syntax.

292. THE STRUCTURE OF SERBO-CROATIAN. 4 HOURS. Serbo-Croatian phonology, morphology, and syntax presented as a background and basis for comparison of the East Slavic and South Slavic branches of the Slavic languages.

299. INDEPENDENT STUDY. 1 TO 6 HOURS. May be repeated for credit. Investigation of special problems under the general direction of a staff member. Prerequisite: Consent of the instructor and the head of the department.

310. INTRODUCTION TO SLAVIC LINGUISTICS. 4 HOURS. Survey of fundamental linguistic concepts and investigation of theoretical methods most applicable to analysis of the Slavic languages. Prerequisites: Graduate standing and two years of Russian or some other Slavic language. Advanced undergraduate students with exceptional ability may be admitted with the consent of the instructor.

399. INDEPENDENT STUDY. 1 TO 4 HOURS. Investigation of special problems under the general direction of a staff member. Prerequisite: Consent of the instructor and the head of the department.

SOCIAL WORK (SocW)

200. CAREERS IN HUMAN SERVICES. 2 TO 4 HOURS. The philosophy and values underlying the human services careers and their organizations and consumers; examination of these areas in relation to changing concepts. Identification of the challenges confronting our society and the human services careers and suggested alternatives for coping with such demands. Prerequisite: Sophomore standing.

305. EDUCATION POLICY FOR CITIZENS. 4 HOURS. Same as Education 305. The concepts and information that all citizens need to participate effectively as education consumers and policy affectors. History, economics, basic statistics, sociology, research, and current and future trends affecting American education at all levels. Prerequisite: Consent of the instructor.

SOCIOLOGY (Soc)

100. INTRODUCTION TO SOCIOLOGY. 4 HOURS. Analysis and description of the structure and dynamics of human society. The application of scientific methods to the observation and analysis of social norms, groups, intergroup relations, social change, social stratification, and institutions.

110. INTRODUCTORY SOCIAL PSYCHOLOGY. 4 HOURS. Credit is not given for Sociology 110 if the student has credit in Sociology 210 or Psychology 255. Survey of the major concepts and studies in social psychology. Prerequisite: Soc. 100.

120. SOCIAL PROBLEMS. 4 HOURS. Survey of the incidence and character of social problems in contemporary society. Prerequisite: Soc. 100.

197. GENERAL EDUCATION COLLOQUIUM ON SOCIOLOGY. 4 HOURS. May be repeated for credit with consent of the instructor. Special topics designed for general education. Prerequisite: Soc. 100.

200. AMERICAN SOCIETY. 4 HOURS. Credit is not given for Sociology 200 if the student has credit in Sociology 100. Intended primarily for juniors and seniors who have not taken Sociology 100. Survey of the major institutions of American society—economic, political, and religious. Prerequisite: Junior or senior standing or consent of the instructor.

201. INTRODUCTORY SOCIOLOGICAL STATISTICS. 4 HOURS. 3 hours of lecture, 2 hours of laboratory per week. Introduction to the basic statistical methods used in the analysis of sociological data. Prerequisites: Math. 100, Soc. 100.

202. INTRODUCTION TO SOCIOLOGICAL RESEARCH. 4 HOURS. 3 hours of lecture, 1 hour of laboratory per week. Survey of the principal methods used in the analysis of sociological data: problem and concept formation, design of research, sampling, and inference. Prerequisite: Soc. 100.

203. SOCIOLOGICAL ANALYSIS. 4 HOURS. 3 hours of lecture, 2 hours of laboratory per week. Application of statistical methods in the analysis of sociological data: multivariate, causal, secondary data, and observational analysis, index instruction. Prerequisites: Soc. 201, 202.

210. INTRODUCTION TO SOCIAL PSYCHOLOGY FOR UPPERCLASSMEN. 4 HOURS. Credit is not given for Sociology 210 if the student has credit in Sociology 110 or Psychology 255. Critical analysis of theory and research in major areas of social psychology. Prerequisites: Junior standing and Soc. 100.

215. COLLECTIVE BEHAVIOR. 4 HOURS. Crowds and diffuse collectivities; collective processes, such as panics, crazes, and hostile mobs; the relationship between societal conditions and occurrence of these processes; the relationship of collective behavior to social change. Prerequisite: Soc. 100.

216. SOCIAL MOVEMENTS. 4 HOURS. Origins of social conflict and alienation; development and articulation of ideologies and mass organizations; consequences of success and failure of social movements and, with special emphasis, political movements. Prerequisite: Soc. 100.

220. SOCIOLOGY OF MASS COMMUNICATIONS. 4 HOURS. Sociological analysis of the mass media of communication; empirical studies of the impact of the media on American society and culture; impact of television on children; effects of the media upon attitudes and opinions; processes by which news is created and transmitted. Prerequisite: Soc. 100.

225. RACIAL AND CULTURAL MINORITIES. 4 HOURS. Same as Black Studies 225. Sociological and social-psychological analysis of racial, religious, or other ethnic groups; consideration of some of the historical and current social problems resulting from their relationships in society. Prerequisite: Soc. 100.

230. SOCIOLOGY OF DEVIANCE. 4 HOURS. Same as Criminal Justice 230. The substantive topic of deviant behavior and the various theoretical orientations advanced to explain it. Prerequisite: Soc. 100.

231. CRIMINOLOGY. 4 HOURS. Same as Criminal Justice 231. The nature and extent of crime in American society; assessment and evaluation of the various factors and influences that lead to criminal behavior; various measures proposed for the control of criminal behavior. Prerequisite: Soc. 230.

232. JUVENILE DELINQUENCY. 4 HOURS. Same as Criminal Justice 232. Various conceptions of the nature of juvenile delinquency and its causes; the

juvenile-court movement; juvenile detention, treatment of juvenile offenders; delinquency control programs. Prerequisite: Soc. 230.

243. SOCIOLOGY OF EDUCATION. 4 HOURS. The relationship of the educational system to the social structure, major emphasis on the role of education in an advanced technological society. Prerequisite: 8 hours of sociology.

245. MARRIAGE AND FAMILY. 4 HOURS. The functions of marriage and the family considered in their social context; special reference to mate selection, socialization and adjustment to marital roles, and phases of the family life cycle. Prerequisite: Soc. 100 or consent of the instructor.

246. THE SOCIOLOGY OF RELIGION. 4 HOURS. Same as Religious Studies 246. Analysis of the structures and functions of religious institutions, particularly as found in modern society. Special attention to the interplay among religion and other social phenomena, such as economics and politics; the social-psychological aspects of religious behavior; current trends in religious institutions. Prerequisite: Soc. 100.

265. THE SOCIOLOGY OF POLITICS. 4 HOURS. Political socialization, beliefs, and behavior; development of conflict and consensus; political institutions and the process of institutionalization; power and the power structures. Prerequisite: Soc. 100.

271. POPULATION AND HUMAN ECOLOGY. 4 HOURS. 3 hours of lecture, 2 hours of laboratory per week. A general introduction to population characteristics and trends in population dynamics—fertility, mortality, and migration. Prerequisite: Soc. 100 or the equivalent.

276. URBAN SOCIOLOGY. 4 HOURS. The application of sociological concepts and data in the study of the city and urban areas. Prerequisite: Soc. 100.

287. SENIOR SEMINAR I. 2 HOURS. No credit is given for Sociology 287 until completion of 288. Students report to the seminar on current research and developments among sociologists and submit to questions, criticism, and evaluation of their reports. Prerequisites: Sociology major, senior standing, and all-University 4.000 average.

288. SENIOR SEMINAR II. 2 HOURS. Continues Sociology 287. Students report to the seminar on current research and developments among sociologists and submit to questions, criticism, and evaluation of their reports. Prerequisite: Soc. 287.

289. SUPERVISED STUDY OR RESEARCH. 2 TO 6 HOURS. Special projects arranged in advance by faculty or student initiative. Prerequisite: Approval of the department.

290. EDUCATIONAL PRACTICE WITH SEMINAR I. 8 HOURS. Same as Education 270. The first half of a practice teaching two-segment sequence, including seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Ed. 250, admission to advanced standing, and recommendation of the department of specialization.

291. EDUCATIONAL PRACTICE WITH SEMINAR II. 8 HOURS. Same as Education 271. The second half of a practice teaching two-segment sequence, including seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Ed. 250, credit or concurrent registration in Soc.

290, admission to or continuation of advanced standing, and recommendation of the department of specialization.

297. GENERAL EDUCATION COLLOQUIUM IN SOCIOLOGY. 4 HOURS. May be repeated for credit with consent of the instructor. Special topics designed for general education for upperclassmen. Prerequisites: Junior standing and Soc. 100.

299. HONORS COURSE. 2 TO 6 HOURS. May be repeated with the permission of the department. Individual study of research projects. Prerequisites: Major in sociology, senior standing, all-University 4.000 average and approval of the department.

300. EXPLORATORY SOCIAL DATA ANALYSIS. 4 HOURS. 3 hours of lecture-discussion, 2 hours of laboratory per week. Introduction to the analysis of social data; relationship between data analysis and measurement operations; transformations of data; construction of indices; graphical display of data; analysis and interpretation of residuals. Prerequisites: Soc. 201 and 8 hours of upper-division sociology or consent of the instructor.

301. SOCIOLOGICAL STATISTICS. 4 HOURS. 3 hours of lecture, 2 hours of laboratory per week. Intended primarily for graduate and advanced undergraduate sociology majors. Introduction to statistical tests of sociological hypotheses; estimation procedures; selected statistical procedures commonly used in sociology. Prerequisite: Upper-division standing or consent of the instructor.

302. ADVANCED STATISTICS IN SOCIOLOGY. 4 HOURS. Analysis of contingency tables; multiple and partial, linear and nonlinear correlation; analysis of variance. Prerequisite: Soc. 301.

305. RESEARCH TECHNIQUES IN SOCIOLOGY. 4 HOURS. 3 hours of lecture-discussion, 2 hours of laboratory per week. Several common techniques of collecting and organizing sociological data, such as questionnaires and interview schedules, systematic observation, scaling, nonreactive measures, content analysis. Prerequisites: 8 hours of upper-division sociology and consent of the instructor.

306. RESEARCH DESIGN IN SOCIOLOGY. 4 HOURS. Formulation of researchable problems; designing research procedures and selecting techniques to fit particular objectives; planning controls to distinguish among alternative hypotheses. Prerequisite: Soc. 301 or consent of the instructor.

314. SOCIAL PSYCHOLOGY OF ORGANIZATIONS. 4 HOURS. Sociological analysis of the mutual influence of individuals and social organizations through such organizational processes as recruitment, socialization, interaction, innovation, and social control. The entire range of social organizations is considered, such as polities, social movements, communities, bureaucracies, families, gangs, friendships, encounters. Prerequisites: Soc. 110 or 210 and 8 hours of upper-division sociology.

316. ADULT SOCIALIZATION. 4 HOURS. Socialization as a process of induction into new roles, which occurs throughout the life cycle; the process is analyzed both at a social-psychological and a social-systems level with illustrations from various settings, such as marriage and family, illness, migration, and particularly socialization into occupations and professions. Prerequisite: 8 hours of sociology at the 200 or 300 level.

318. SOCIOLOGY OF LITERATURE. 4 HOURS. How literature is influenced by and in turn influences social forces; effects of social class, political and economic

factors, and religious, ethnic, and racial affiliations on literary works, attitudes of writers, relationships to publics, reward systems, and related matters. Prerequisites: 8 hours of upper-division sociology and 6 hours of literature (any department) or consent of the instructor.

319. TOPICS IN SOCIAL PSYCHOLOGY. 4 HOURS. May be repeated for up to 12 hours credit. Intensive analysis of a specialized topic. Each topic is announced at the time the class is scheduled. Prerequisites: Soc. 110 or 210 and 8 hours of upper-division sociology.

325. AGE GROUPS AND THE SOCIAL ORDER. 4 HOURS. The relation of age groups to social structure; the demographic, sociological, and social-psychological conditions affecting the salience of age as a basis of social organization; recent writings on adolescents and youth; the theory of subcultures as applied to youth groups; relations between generations; current directions in the study of youth groups, both conventional and deviant. Prerequisite: 4 hours of upper-division sociology.

333. SOCIOLOGY OF LAW. 4 HOURS. Same as Criminal Justice 333. The origin and development of legal norms in various social settings; their relationship to custom and incorporation in legal and quasi-legal institutions; special attention to the difference between legal and sociological reasoning; law as an instrument of social change. Prerequisite: 8 hours of upper-division sociology, including Soc. 230 or CrJ. 230, or consent of the instructor.

335. TOPICS IN DEVIANCE AND SOCIAL CONTROL. 4 HOURS. May be repeated for up to 12 hours of credit. Intensive analysis of a specialized topic in the sociology of law, deviance, and social control. Each topic is announced at the time the class is scheduled. Prerequisite: 8 hours of upper-division sociology including Soc. 230 or consent of the instructor.

341. SOCIAL STRATIFICATION AND CLASSES. 4 HOURS. Nature and systems of differentiation and ranking in societies, emphasis on the class structure in the United States; life chances, prestige, status, power, and social mobility in the United States and other societies. Prerequisite: 8 hours of upper-division sociology.

343. TOPICS IN THE SOCIOLOGY OF EDUCATION. 4 HOURS. May be repeated for up to 12 hours of credit. Intensive examination of a specialized topic, which is announced each time the course is scheduled. Prerequisites: 8 hours of upper-division sociology and consent of the instructor.

344. INDUSTRIAL SOCIOLOGY. 4 HOURS. Analysis of industrial institutions in contemporary society; management, labor, and the community. Prerequisite: 8 hours of sociology.

345. THE SOCIOLOGY OF THE FAMILY. 4 HOURS. The family as a social institution; its functions and forms in contemporary society. Prerequisite: 8 hours of sociology or consent of the instructor.

346. SOCIOLOGY OF SCIENCE. 4 HOURS. Organizations of the scientific enterprise; emergence of science as a social institution; interrelations with other institutions, such as government, religion, economy, and the arts. Science as a social phenomenon; regularities in scientific behavior; consideration of both historical and contemporary material. Prerequisite: 8 hours of sociology.

347. SOCIOLOGY OF COMPLEX ORGANIZATIONS. 4 HOURS. Characteristics of business, government agencies, schools, hospitals, and other large-scale organizations; approaches used to study organizations; theoretical and empirical analysis of organizational processes. Prerequisites: Senior standing and 8 hours of sociology, or consent of the instructor.

348. TOPICS IN THE SOCIOLOGY OF WAR. 4 HOURS. Intensive analysis of selected topics, including comparative military organization, the relationships between military institutions and other institutions of the larger society, and their roles in social conflict and change. Prerequisites: Soc. 100 and 12 hours of either sociology, political science, history, or economics or consent of the instructor.

349. SOCIOLOGY OF OCCUPATIONS AND PROFESSIONS. 4 HOURS. Theoretical and empirical analysis of the occupational structure and occupational mobility processes in American and other industrial societies; patterns of recruitment and retention in occupations and professions. Prerequisite: Soc. 203 or consent of the instructor.

351. MEDICAL SOCIOLOGY. 4 HOURS. Sociological contributions to medicine and public health; social organization and the organization of health services; the sociology of illness. Prerequisite: 8 hours of upper-division sociology.

352. SOCIAL EPIDEMIOLOGY: SOCIAL AND CULTURAL FACTORS IN HEALTH AND DISEASE. 4 HOURS. The methods of social epidemiology as they apply to chronic and acute disease; psychosocial factors in illness; individual and social reactions to health and disease. Prerequisite: 8 hours of upper-division sociology.

353. HEALTH CARE SYSTEMS. 4 HOURS. The organization of medical care in the United States and selected other countries. Methods of delivering medical care to various populations; emphasis on urban medicine. Prerequisite: 8 hours of upper-division sociology.

354. URBAN MEDICINE. 2 HOURS. Same as Preventive Medicine and Community Health 399B (College of Medicine). A combination of preceptorship and seminar-discussion for advanced clinical students; several models of the urban health care setting are examined by direct participation; seminar topics evaluate the nature of and factors contributing to each of the models being studied; opportunity for critical observation and evaluation of special interest areas, such as private practice, group practice, private hospital, public hospital, health department and public health programs, health care plans, neighborhood health centers, and others as student interest dictates. Prerequisite: Consent of the instructor.

355. TOPICS IN MEDICAL SOCIOLOGY. 4 HOURS. May be repeated for up to 12 hours of credit. Intensive analysis of the methods and literature in a selected sub-field of medical sociology. Each topic is announced at the time the class is scheduled. Prerequisites: Soc. 351 and consent of the instructor.

357. FIELD EXPERIENCE IN MEDICAL SOCIOLOGY. 2 TO 12 HOURS. Field placement in a medical institution for sociology students. Critical observation and the application of sociological concepts in the study of special interest areas, such as the role of the patient, patient-doctor relationship, and socialization into the health profession. Prerequisite: 12 hours of upper-division sociology including Soc. 351 or 352 or Soc. 353 and consent of the instructor.

361. SOCIAL GERONTOLOGY: OLD PEOPLE IN AMERICA. 4 HOURS. The aged:

demographic trends, economic status, physical and social needs, family relationships. Prerequisite: 8 hours of upper-division sociology.

365. TOPICS IN THE SOCIOLOGY OF POLITICS. 4 HOURS. May be repeated for up to 12 hours of credit. Intensive analysis of a specialized topic concerning the sociological study of politics. Each topic is announced at the time the class is scheduled. Prerequisites: 8 hours of upper-division sociology and consent of the instructor. Sociology 265 is recommended.

366. COMMUNITY POWER STRUCTURE. 4 HOURS. Analysis of the power structure of American communities; special emphasis on the relation between theoretical assumptions and research procedures in current community studies. Prerequisite: 12 hours of sociology or consent of the instructor.

371. POPULATION I. 4 HOURS. 2 hours of lecture, 2 hours of laboratory-discussion per week. Primarily for sociology majors and graduate students. The measurement and study of major trends and differentials in fertility, mortality, population growth, and age-sex composition in the United States and other countries. Emphasis on social and cultural determinants and consequences. Prerequisite: 12 hours of sociology, including Soc. 201 or the equivalent.

372. POPULATION II. 4 HOURS. 2 hours of lecture, 2 hours of laboratory-discussion per week. The measurement and study of major trends in migration, population composition, marriage and divorce in the United States and other countries; theories and policies regarding population growth in relation to resources; population forecasting. Prerequisite: Soc. 371.

373. HUMAN ECOLOGY. 4 HOURS. The relationship between man and the natural environment. Emphasis on the importance of population patterns and human institutions in adaptation. Prerequisite: 12 hours of sociology, including Soc. 201 or the equivalent, or consent of the instructor.

375. TOPICS IN POPULATION AND HUMAN ECOLOGY. 4 HOURS. May be repeated for up to 12 hours of credit. Intensive analysis of a specialized topic concerning population or human ecology. Each topic is announced at the time the class is scheduled. Prerequisites: 8 hours of upper-division sociology and consent of the instructor.

376. TOPICS IN URBAN SOCIOLOGY. 4 HOURS. May be repeated for up to 12 hours of credit. Intensive analysis of a specialized topic. Each topic is announced at the time the class is scheduled. Prerequisites: 8 hours of upper-division sociology and consent of the instructor.

381. TOPICS IN SOCIAL CHANGE. 4 HOURS. Intensive analysis of a specialized topic on processes of social change. Each topic is announced at the time the class is scheduled. Prerequisites: 8 hours of upper-division sociology and consent of the instructor.

384. TOPICS IN SOCIOLOGICAL THEORY CONSTRUCTION. 4 HOURS. Intensive study of various topics in contemporary sociological theory construction. Prerequisite: Soc. 202.

385. HISTORY OF EUROPEAN SOCIOLOGICAL THEORY. 4 HOURS. European foundations of modern sociology from the French Revolution through the aftermath of World War I, with emphasis on selected European theorists who have had a strong impact on modern sociology. Their works are viewed both analytically and historically. Prerequisite: 8 hours of upper-division sociology.

386. HISTORY OF AMERICAN SOCIOLOGICAL THEORY. 4 HOURS. American foundations of modern sociology from the Civil War to World War II, with emphasis on selected American theorists who have had a strong impact on contemporary sociology. Their works are viewed both analytically and historically. Prerequisite: 8 hours of upper-division sociology.

387. CONTEMPORARY SOCIOLOGICAL THEORY. 4 HOURS. Issues and thinkers associated with the development of sociological theory since World War II, presented analytically and in terms of the social context in which it was written. Stress on the implications of this work for future research. Prerequisite: 8 hours of upper-division sociology.

389. INDEPENDENT STUDY. 2 TO 12 HOURS. Supervised study projects for graduate students and honors undergraduates: may consist of extensive readings in specialized areas of sociology or empirical research. Prerequisites: Soc. 263, 20 hours of sociology, and approval of the department.

395. TOPICS IN SOCIAL ORGANIZATION AND INSTITUTIONS. 4 HOURS. May be repeated for up to 12 hours of credit. Intensive analysis of a specialized topic. Prerequisite: 8 hours of upper-division sociology and consent of the instructor.

SPANISH (Span)

100. INTENSIVE ELEMENTARY SPANISH. 8 HOURS. Two additional hours per day in the language laboratory. Special accelerated course, equivalent to Spanish 101 and 102 combined.

101. ELEMENTARY SPANISH I. 4 HOURS. Two additional half hours per week in the language laboratory. For students without credit in Spanish. Oral practice, reading, and grammar.

102. ELEMENTARY SPANISH II. 4 HOURS. Two additional half hours per week in the language laboratory. Continues Spanish 101. Prerequisite: Span. 101 or the equivalent.

103. ELEMENTARY SPANISH III. 4 HOURS. Two additional half hours per week in the language laboratory. Continues Spanish 102. Prerequisite: Span. 102 or the equivalent.

104. INTERMEDIATE SPANISH I. 4 HOURS. Two additional half hours per week in the language laboratory. Rapid reading, grammar review, composition, conversation. Prerequisite: Span. 103 or two years of high school Spanish.

105. INTERMEDIATE SPANISH II. 4 HOURS. Continues Spanish 104. Prerequisite: Span. 104 or the equivalent.

106. INTERMEDIATE SPANISH III. 4 HOURS. Continues Spanish 105. Prerequisite: Span. 105 or the equivalent.

110. INTENSIVE ELEMENTARY/INTERMEDIATE SPANISH. 8 HOURS. Two additional hours per week in the language laboratory. Continues Spanish 100. Special accelerated course; work is equivalent to that in Spanish 103 and 104 combined. Prerequisite: Span. 100 or 102 or the equivalent.

115. ELEMENTARY COMPOSITION AND CONVERSATION. 2 HOURS. Difficulty level: Spanish 104 through 106. May be taken concurrently with Spanish 105 or

106. Does not count toward the major in Spanish. Prerequisite: Span. 104 or two years of high school Spanish.

120. INTENSIVE INTERMEDIATE SPANISH. 8 HOURS. Two additional hours per week in the language laboratory. Continues Spanish 110. Special accelerated course; work is equivalent to that in Spanish 105 and 106 combined. Prerequisite: Span. 110 or 104 or the equivalent.

150. ACCELERATED SPANISH. 12 HOURS. Designed for students with demonstrated linguistic aptitude who have achieved A or B+ in Spanish 102 or 100, which permits an intensive quarter of Spanish in order to reach the 106 standard, which will satisfy the language requirement. Normally students should take only one other 4 hour course during the quarter. Prerequisites: Span. 102 or 100.

187. MASTERPIECES OF SPANISH LITERATURE IN ENGLISH TRANSLATION. 4 HOURS. Same as Humanities 187 and Latin American Studies 187. Not open to Spanish majors. F

199. ALTERNATE COURSE IN SPANISH. 1 TO 12 HOURS. May be repeated for credit up to 12 hours. Special remedial course: rapid revision and particular skill development, such as in reading, writing, and speaking; special cases involving learning difficulties.

211. INTERMEDIATE COMPOSITION AND CONVERSATION I. 3 HOURS. Prerequisite: Span. 106 or four years of high school Spanish.

212. INTERMEDIATE COMPOSITION AND CONVERSATION II. 3 HOURS. Continues Spanish 211. Prerequisite: Span. 211 or the equivalent.

213. INTERMEDIATE COMPOSITION AND CONVERSATION III. 3 HOURS. Continues Spanish 212. Prerequisite: Span. 212 or the equivalent.

214. ADVANCED COMPOSITION AND CONVERSATION I. 3 HOURS. Prerequisite: Span. 213 or the equivalent.

215. ADVANCED COMPOSITION AND CONVERSATION II. 3 HOURS. Continues Spanish 214. Prerequisite: Span. 214 or the equivalent.

216. ADVANCED COMPOSITION AND CONVERSATION III. 3 HOURS. Continues Spanish 215. Prerequisite: Span. 215 or the equivalent.

217. SPOKEN SPANISH. 3 HOURS. Intensive course. Exclusively oral-aural. Prerequisite: Span. 213 or the equivalent.

218. SPANISH LITERATURE TO 1700. 4 HOURS. Highlights of Spanish literature from its beginning through the seventeenth century. Prerequisite: Span. 106 or the equivalent.

219. SPANISH LITERATURE FROM 1700 TO 1900. 4 HOURS. Continues Spanish 218. Prerequisite: Span. 106

221. SPANISH LITERATURE OF THE TWENTIETH CENTURY. 4 HOURS. Continues Spanish 219. Highlights of the twentieth century. Prerequisite: Span. 106 or the equivalent.

222. INTRODUCTION TO SPANISH LITERATURE AND CRITICISM. 4 HOURS. Required for Spanish majors. Introduction to critical techniques in various literary genres and a historical perspective on the previous three-term introductory survey of Spanish literature. Prerequisite: Span. 221.

223. SPANISH-AMERICAN FICTION OF THE TWENTIETH CENTURY I. 4 HOURS. Same as Latin American Studies 223. Readings in contemporary Spanish-American novelists and short story writers. Prerequisite: Span. 106 or 120 or four years of high school Spanish or the equivalent.

224. SPANISH-AMERICAN FICTION OF THE TWENTIETH CENTURY II. 4 HOURS. Same as Latin American Studies 224. Continues Spanish 223. Prerequisite: Span. 223.

231. HISPANIC CULTURE: SPAIN. 4 HOURS. Required for teacher education majors in Spanish. Consideration of the cultural aspects of Spanish civilization. Prerequisite: Any 200-level literature course or consent of the instructor.

232. HISPANIC-AMERICAN CULTURE. 4 HOURS. Same as Latin American Studies 232. Required for teacher education majors in Spanish. Consideration of the cultural aspects of Spanish-American civilization. Prerequisite: Any 200-level literature course or consent of the instructor.

233. LATIN-AMERICAN CULTURE IN CHICAGO. 4 HOURS. Same as Latin American Studies 233. Organizations and major activities of the predominant *latino* groups in Chicago: Mexican, Puerto Rican, and Cuban. Prerequisite: Any 200-level course in Spanish or consent of the instructor.

240. SPANISH LITERATURE IN TRANSLATION I. 4 HOURS. Same as Humanities 240. Not open to Spanish majors or minors nor to students who have credit in courses above Spanish 200. Major works from the *Cid* to the end of the nineteenth century. Prerequisite: Sophomore standing or consent of the instructor.

241. SPANISH LITERATURE IN TRANSLATION II. 4 HOURS. Same as Humanities 241. Not open to Spanish majors or minors nor to students who have credit in courses above Spanish 200. Major works from 1898 to the present. Prerequisite: Sophomore standing or consent of the instructor.

242. SPANISH-AMERICAN LITERATURE IN TRANSLATION. 4 HOURS. Same as Latin American Studies 222. Not open to Spanish majors or minors nor to anyone with credit in Spanish courses above the 200 level. Major works from the beginning of Spanish-American literature to the present; special emphasis on the nineteenth and particularly the twentieth centuries. Prerequisite: Sophomore standing or consent of the instructor.

252. ADVANCED GRAMMAR. 4 HOURS. Required for teacher education majors in Spanish. Systematic study of syntactic and morphological problems. Prerequisites: Span. 213 and any 200-level literature course.

253. ADVANCED GRAMMAR. 4 HOURS. Required for teacher education majors in Spanish. May be taken concurrently with Spanish 252. Continues Spanish 252. Prerequisites: Span. 213 and any 200-level literature course.

280. TEACHERS COURSE I. 4 HOURS. Required for teacher education majors in Spanish. Various theories and approaches regarding the learning of a second

language. Evaluation of current materials and textbooks. Teaching demonstrations in classroom situations. Prerequisites: Junior standing and four 200-level Spanish courses.

281. TEACHERS COURSE II. 4 HOURS. Required for teacher education majors in Spanish. Continues Spanish 280. Recent developments in the teaching of Spanish; modern foreign language testing, use of audio-visual media, operation of a language laboratory, preparation of audio and video tapes. Prerequisite: Span. 280 or consent of the instructor.

291. SENIOR THESIS. 2 HOURS. May be repeated for a maximum of 6 hours. For candidates for honors in Spanish. Prerequisite: Honors status.

299. INDEPENDENT STUDY. 1 TO 6 HOURS. Open only to Spanish majors. Prerequisite: Consent of the instructor.

301. CONTEMPORARY SPANISH POETRY. 4 HOURS. From Modernism to the present. Readings and interpretation of the works of some of the best known poets of the period. Prerequisite: Span. 219 or 221.

302. CONTEMPORARY SPANISH THEATER. 4 HOURS. Plays of some of the best known contemporary authors, from Benavente to Sastre. Prerequisite: Span. 219 or 221.

303. NINETEENTH CENTURY SPANISH NONROMANTIC DRAMA. 4 HOURS. Representative outlines of nonromantic plays, their characteristics and development. Prerequisite: Span. 219 or 221.

305. SPANISH ROMANTICISM. 4 HOURS. Representative works of the Romantic period; particular emphasis on Romantic drama and poetry. Prerequisite: Span. 219 or 221.

306. REALISM IN NINETEENTH CENTURY SPANISH LITERATURE. 4 HOURS. Continues Spanish 305. Prerequisite: Span. 219 or 221.

307. THE GENERATION OF 1898. 4 HOURS. Representative works of Baroja, Azorin, Unamuno, Maeztu, Valle Inclan, Benavente, A. Machado, and others. Prerequisite: Span. 219 or 221.

308. SPANISH-AMERICAN LITERATURE TO 1888 I. 4 HOURS. Same as Latin American Studies 308. Development from the sixteenth century through the end of the Romantic period. Prerequisite: Span. 223 or 224 or the equivalent.

309. SPANISH-AMERICAN LITERATURE TO 1888 II. 4 HOURS. Same as Latin American Studies 309. Continues Spanish 308. Prerequisite: Span. 223 or 224.

310. *MODERNISMO* AND CONTEMPORARY SPANISH-AMERICAN POETRY I. 4 HOURS. Same as Latin American Studies 310. Spanish-American poetry from 1888 to the present, with some *Modernista* prose. Prerequisite: Span. 223 or 224.

311. *MODERNISMO* AND CONTEMPORARY SPANISH-AMERICAN POETRY II. 4 HOURS. Same as Latin American Studies 311. Continues Spanish 310. Prerequisite: Span. 223 or 224.

314. POETRY OF THE GOLDEN AGE. 4 HOURS. Development of Spanish lyric poetry out of both popular and classical sources. *Romances,* Renaissance poetry, mystic poetry, *culteranismo, conceptismo.* Prerequisite: Span. 218.

315. DRAMA OF THE GOLDEN AGE. 4 HOURS. Development of Spanish theater in the Golden Age; detailed study of plays by Lope de Vega, Tirso de Molina, Calderon, and other representative dramatists. Prerequisite: Span. 218.

317. PROSE OF THE GOLDEN AGE. 4 HOURS. Major examples of picaresque, pastoral, and chivalric forms. Prerequisite: Span. 218.

318. MINOR WORKS OF CERVANTES. 4 HOURS. The prose of Cervantes and its relationship to his masterpiece. Prerequisite: Span. 218.

319. *DON QUIJOTE.* 4 HOURS. Reading and discussion; emphasis on novelistic technique and development of the novel. Prerequisite: Span. 218.

320. THE CONTEMPORARY SPANISH NOVEL I. 4 HOURS. The novel as it has developed since 1936. Prerequisite: Span. 219 or 221.

321. THE CONTEMPORARY SPANISH NOVEL II. 4 HOURS. Continues Spanish 320. Prerequisite: Span. 219 or 221.

322. REGIONALISM AND POPULARISM IN THE SPANISH NOVEL. 4 HOURS. Origins, development, characteristics, and significance of regionalism-popularism in Spanish literature and its relation to Spanish regions. Prerequisite: Span. 219.

323. THE CONTEMPORARY SPANISH-AMERICAN NOVEL I. 4 HOURS. Same as Latin American Studies 323. From the Romantic period to 1930. Prerequisite: Span. 223 or 224 or the equivalent.

324. THE CONTEMPORARY SPANISH-AMERICAN NOVEL II. 4 HOURS. Same as Latin American Studies 324. Continues Spanish 323. From 1930 to the present. Prerequisite: Span. 223 or 224.

340. HISTORY OF THE SPANISH LANGUAGE. 4 HOURS. General survey of the development of the Spanish language. Prerequisite: Consent of the instructor.

341. STUDIES IN PENINSULAR LANGUAGES. 4 HOURS. May be repeated for credit. Dialects and languages of the Iberian Peninsula, including Catalan, Galician, Aragonese, Leonese. Topic varies from quarter to quarter. Prerequisite: Span. 340 or an equivalent course in any Romance language or approval of the department.

342. INTRODUCTION TO ROMANCE PHILOLOGY. 4 HOURS. History of the Romance languages, especially Spanish, French, Italian, and Portuguese, from the classical Latin period to the present; their external history, phonology, morphology, and syntax. Prerequisite: Consent of the instructor.

345. MEDIEVAL SPANISH LITERATURE I. 4 HOURS. Important works from the beginnings to 1400. Prerequisite: Span. 218. Spanish 340 is recommended.

346. MEDIEVAL SPANISH LITERATURE II. 4 HOURS. Important works of the fifteenth century. Prerequisite: Span. 218. Spanish 340 is recommended.

349. PHONETICS. 4 HOURS. Prerequisites: Span. 213 and 218 or 221.

361. SPANISH ABROAD. 0 TO 15 HOURS. May be repeated for credit for a maximum of 45 hours. Lectures, seminars, and practical work in Spanish language, literature, and civilization, taken in Spain. Prerequisites: Span. 214 or the equivalent; Span. 218, 219 or the equivalents; 3.500 overall average; 4.000 average in Spanish courses.

371. SPANISH FOR TEACHERS. 4 HOURS. Consideration of those language problems suggested by teaching experience. It is recommended that this course be taken after student teaching, in the last quarter before graduation. Also open to experienced teachers. Prerequisite: Student or professional teaching experience.

390. TOPICS IN SPANISH LITERATURE. 6 HOURS. May be repeated. Topics vary from quarter to quarter. Prerequisite: Consent of the instructor.

399. INDEPENDENT STUDY. 1 TO 6 HOURS. Supervised study in an area not covered by regularly offered courses, under the direction of a faculty member designated at the discretion of the department on the request of a qualified student. Individual conferences, assigned readings and papers, and other work are required. Prerequisites: Spanish major with senior standing or graduate student in Spanish and approval of the department.

SPEECH AND THEATER (Spch)

100. PRINCIPLES OF EFFECTIVE SPEAKING. 3 HOURS. Students must register for a lecture and a recitation section. Analysis of contemporary speech-making theory; emphasis on message selection, analysis, structuring, and support; audience analysis and adaptation; language; examination of principles of delivery.

101. EFFECTIVE SPEAKING. 2 HOURS. Application of the principles of effective speech-making. Practice in the preparation and presentation of short speeches. Prerequisite: Spch. 100.

102. PRINCIPLES OF EFFECTIVE SPEAKING. 4 HOURS. Prerequisite: James Scholar or dean's list status or speech major or consent of the department.

107. PARLIAMENTARY PROCEDURE. 2 HOURS. Principles and practice.

111. FOUNDATIONS OF COMMUNICATION THEORY. 4 HOURS. The development of communication theory from Plato and Aristotle to the twentieth century. Consideration of concepts, including relationships between societal needs and communication theory, free speech, development of parliamentary institutions, and fundamental communication principles.

112. INTERPERSONAL COMMUNICATION THEORY. 4 HOURS. Cognitive, linguistic, and physical processes in communication. Communication models, cognitive dissonance, language behavior, feedback and channels.

113. MASS COMMUNICATIONS THEORY. 4 HOURS. The nature of mass communications; particular consideration of major concepts, including communication technology and societal change, information transmission and diffusion, content analysis and the measurement of effects, the institutionalization of mass communications, freedom and responsibility in public and private channels, and the relationship of mass communications to mass culture.

121. INTRODUCTION TO THE THEATER. 4 HOURS. The nature and elements of theater—the theories, styles, and semantics of theater arts.

122. SURVEY OF THEATER HISTORY. 4 HOURS. Introduction to the major historical periods of the development of the theater and drama from ancient Greece to the present. Prerequisite: Spch. 121.

123. CONTEMPORARY THEATER. 4 HOURS. Critical and analytical study of current theater productions based upon modern literary, production, and performance standards. Students will attend and analyze several currently produced plays in the Chicago area. Prerequisite: Spch. 121.

131. SURVEY OF CONTEMPORARY BROADCASTING. 4 HOURS. Introduction to the history, structure, operation and impact of American broadcasting and its relation to other media and institutions in our society. Prerequisite: Sophomore standing.

141. ORAL INTERPRETATION OF LITERATURE. 4 HOURS. Oral reading for understanding, appreciation, and communication.

151. INTRODUCTION TO TECHNICAL THEATER. 4 HOURS. A lecture-laboratory approach to the basic techniques of play production. Survey of historical background and sources, theories, styles, methods and materials of scene design, stage lighting, costuming, and makeup. Lectures, readings, and practical problems. Prerequisite: Spch. 121.

171. PRINCIPLES OF CHILDREN'S LANGUAGE ACQUISITION AND SPEECH DEVELOPMENT. 4 HOURS. An introductory course that considers the development, role, and structure of speech and language. Designed to assist the elementary school teacher in identifying and recognizing speech and language development phenomena, including speech and language pathology.

180. SPEECH VARIATION IN URBAN AREAS I. 4 HOURS. Same as Black Studies 180. The development, causes, roles, and structure of urban speech variation; emphasis on black English. A lecture-laboratory approach to the aspects of multidialectal behavior; theories, styles, conflicts. Systematic examination of, and practice in, cross-cultural speech.

181. SPEECH VARIATION IN URBAN AREAS II. 4 HOURS. Same as Black Studies 181. The relationship of ethnolinguistics and aspects of cross-cultural communicative competence. Aspirational and attitudinal factors in language maintenance. Conflicting value systems reflected in speech behavior. Examination of the concepts of superposed standard as a toll language and self-group identity in language interchange. Lecture-practicum. Prerequisite: Spch. 180.

195. ADVANCED VOICE TRAINING. 3 HOURS. Designed to develop in the individual student's voice a wide range of control in pitch, volume, and quality to meet extraordinary voice and speech demands in broadcasting, interpretation, public address, teaching, and theater. Prerequisite: Voice proficiency test, administered by the instructor.

201. BASES OF SPEECH. 4 HOURS. The social, physical, physiological, neurological, phonetic, linguistic, psychological, genetic, and semantic bases of speech.

202. FUNDAMENTALS OF PHONETICS. 4 HOURS. Phonemics and phonetics; emphasis on pronunciation characteristics of American English, ear training, and practice in transcription.

203. ANATOMY AND PHYSIOLOGY OF THE SPEECH MECHANISM. 4 HOURS. Anatomical and physiological characteristics of the normal speech-and-hearing mechanisms; physiology of speech production. Prerequisite: Spch. 201 or 202 or consent of the instructor.

204. SPEECH SCIENCE. 4 HOURS. Voice and speech as related to the physiology of the speech act, acoustics, and the hearing of speech. Prerequisite: Spch. 201 or 202 or consent of the instructor.

210. STATISTICS IN COMMUNICATION RESEARCH. 4 HOURS. Credit is not given for Speech and Theater 210 if the student has credit in Quantitative Methods 171 or Sociology 185 or Geography 185 or Psychology 243. The role of statistics in communication research; the nature of research design; the basic concepts of measurement scales, distributions, parameters, hypothesis testing; methods of assessing differences; methods of assessing relationships. Examples will be drawn from communications research. Prerequisites: Spch. 112 and 113 or consent of the instructor.

211. DISCUSSION. 4 HOURS. Study and practice in the theories and techniques of group discussion; the nature of small-group decision making; discussion as a learning technique. Prerequisite: Spch. 112.

212. ARGUMENTATION. 4 HOURS. The theory of argumentation; evidence, reasoning, and refutation; historical and contemporary debates and argumentative discourse; practice in argumentative speaking.

213. PERSUASION. 4 HOURS. Principles of attitude change, including theories of persuasion and audience analysis. Practice and experimentation in persuasive speaking. Prerequisites: Spch. 111, 112, and 113 or Spch. 215 or consent of the instructor.

215. PSYCHOLOGY OF ATTITUDE AND OPINION. 5 HOURS. Same as Psychology 215. Survey of behavioral approaches to the measurement of social attitudes and opinions; determinants and correlates of public attitudes and opinions. Lecture and participation in field and laboratory studies. Prerequisite: 8 hours of psychology or consent of the instructor for well-qualified speech majors.

227. PLAYWRITING. 4 HOURS. An introductory course in the writing of drama as a distinctive mode of expression intended for theatrical performance. The nature of the theatrical experience and dramatic action through the basic elements of plot, character, theme, dialogue, mood, and spectacle. Specific writing exercises and satisfactory completion of an original one-act play. Prerequisites: Junior standing and Spch. 122 and 123 or consent of the instructor.

231. TELEVISION AND RADIO PERFORMANCE. 4 HOURS. Development of the basic skills for effective dramatic and nondramatic television and radio performance; announcing, interviewing, and acting. Special attention is given to individual performance problems. Lecture and laboratory. Prerequisite: Spch. 113 or consent of the instructor.

232. TELEVISION AND RADIO PRODUCTION. 4 HOURS. Lecture and laboratory course designed to teach advanced production techniques for radio and television. Students are exposed to a variety of radio and television production situations. Prerequisite: Spch. 131 or consent of the instructor.

233. TELEVISION AND RADIO DIRECTING. 4 HOURS. Designed to develop style and skill in television and radio directing; special attention to script analysis, staging, pictorial composition, audio placement and integration, control room operation, crew management, and rehearsal procedures. Prerequisite: Spch. 232.

239. MASS COMMUNICATION PRACTICUM. 5 HOURS. Professional studies in the

mass media. Students work in Chicago-area radio and television stations. The nature of the work is determined in consultation with the department and the station involved. Limited to a few advanced students in mass communications on the basis of written applications submitted one quarter in advance. Prerequisite: Approval of the head of the department.

241. ADVANCED ORAL INTERPRETATION. 4 HOURS. Literary analysis of poetry, prose, and drama; platform presentation of literary materials. Prerequisite: Spch. 141.

251. ADVANCED TECHNICAL THEATER. 4 HOURS. Advanced techniques of play production. Fundamentals of scene design, lighting, and costuming, such as illusion techniques, ornamentation, use of color; techniques of rendering, plotting, and sketching. Practical work with University Theater. Prerequisite: Spch. 151.

261. FUNDAMENTALS OF ACTING. 4 HOURS. Methods of acting; emphasis on basic stage techniques and the role of the character in relation to the intellectual and emotional values of the play. Prerequisites: Spch. 121 and 141 or consent of the instructor.

262. ADVANCED ACTING. 4 HOURS. Study and practice of modern realistic and nonrealistic acting techniques. Development and performance of a full-length characterization. Prerequisite: Spch. 261 or consent of the instructor.

264. FUNDAMENTALS OF STAGE DIRECTING. 4 HOURS. Principles and techniques of the director's art. Fundamentals of staging: blocking, movement, business, tempo; script analysis and rehearsal planning. Specific projects in directing scenes. Prerequisites: Spch. 121 and 261.

265. ADVANCED STAGE DIRECTION. 4 HOURS. Procedures for developing a creative relationship between director and actor in interpreting a play in rehearsal; historical consideration of directional methods. Class analysis of problems of interpretation and stage management; assignment of scenes to demonstrate dramatic values. Prerequisite: Spch. 264.

268. PRACTICUM IN THEATER AND ORAL INTERPRETATION. 1 TO 6 HOURS. May be repeated for credit up to a maximum of 36 hours. No more than 8 hours may be applied to the minimum requirements for a major in speech and theater. Planning and execution of specific topics in acting, oral interpretation, stage management, or technical work directly contributing to major or studio productions of the department. The approval and supervision of the director and the technical director is required. Prerequisites: Spch. 121, 151, and consent of the instructor.

270. EDUCATIONAL PRACTICE WITH SEMINAR I. 8 HOURS. Same as Education 270. The first half of a practice teaching two-segment sequence, including seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Ed. 250, admission to advanced standing, and recommendation of the department of specialization.

271. EDUCATIONAL PRACTICE WITH SEMINAR II. 8 HOURS. Same as Education 271. The second half of a practice teaching two-segment sequence, including seminar, to meet certification requirements for teaching in the elementary or secondary school. Prerequisites: Ed. 250, credit or concurrent registration in Spch. 270, admission to or continuation of advanced standing, and recommendation of the department of specialization.

295. SECONDARY SCHOOL SPEECH CURRICULUM. 4 HOURS. Designed to equip the prospective speech teacher with the objectives, principles, and methods of teaching speech arts in the secondary school. Prerequisites: Junior standing and 16 hours of speech courses.

298. HONORS COURSE: INDIVIDUAL STUDY. 3 HOURS. May be repeated for a maximum of 6 hours. Individual study leading to a thesis to complete requirements for distinction in the Department of Speech and Theater. Prerequisites: 24 hours of speech and theater, 4.000 grade-point average, and consent of the head of the department.

299. INDIVIDUAL TOPICS. 3 HOURS. May be repeated for a maximum of 6 hours. Individual investigation of special problems. Prerequisites: 10 hours of speech and theater, 3.750 grade-point average, and consent of the head of the department.

301. COMMUNICATION ANALYSIS. 4 HOURS. Descriptions, models, proposed dimensions, and statistical treatment of the communication process. Prerequisites: Spch. 112, 113, 201 or 202, and 210 or consent of the instructor.

302. GROUP COMMUNICATION THEORY. 4 HOURS. Detailed analysis and observation of group processes from the viewpoint of modern information and field communication theory. Prerequisites: Spch. 111, 112, 113, 210 and 211 or consent of the instructor.

303. THEORIES OF LANGUAGE PERFORMANCE. 4 HOURS. Contemporary theories and related research in language performance, centering upon selected approaches to language acquisition and behavior; special emphasis on the psycholinguistic approach. Prerequisites: Spch. 112, 201 or 202, and 210 or the equivalent or sufficient language-linguistics background.

311. AMERICAN AND BRITISH PUBLIC ADDRESS I. 4 HOURS. Critical and historical study of American and British speakers and their speeches to 1850. Prerequisites: Spch. 111, 112, 113 and any two of Spch. 211, 212, 213 or consent of the instructor.

312. AMERICAN AND BRITISH PUBLIC ADDRESS II. 4 HOURS. Continues Speech and Theater 311. From 1850 to 1920. Prerequisites: Spch. 111, 112, 113 and any two of Spch. 211, 212, 213 or consent of the instructor.

313. CONTEMPORARY PUBLIC ADDRESS. 4 HOURS. Contemporary speech making; principal focus on issues relating to economics and government, World War II, postwar international problems, and civil rights. Prerequisites: Spch. 111, 112, 113 and any two of Spch. 211, 212, 213 or consent of the instructor.

315. THE RHETORIC OF FREE SPEECH. 4 HOURS. The rhetorical processes employed by those speakers in the British House of Commons and in America who participated in the freedom of speech movements. Consideration is given to issues relating to the contemporary American scene. Prerequisites: Spch. 212 and PolS. 355 or consent of the instructor.

321. EUROPEAN THEATER HISTORY I. 4 HOURS. Historical survey of the theater and theater arts of ancient Greece and Rome, medieval Europe, the Italian Renaissance, and Elizabethan England. Prerequisites: Spch. 122 and at least 8 hours credit chosen from Spch. 241, 251, 261, 262, 264, and 265.

322. EUROPEAN THEATER HISTORY II. 4 HOURS. Historical survey of the theater and theater arts from the seventeenth century to modern times in Europe and

England. Prerequisites: Spch. 122 and at least 8 hours of credit chosen from Spch. 241, 251, 261, 262, 264, and 265.

324. AMERICAN THEATER HISTORY I. 4 HOURS. Development of the American theater from 1700 to 1914; historical trends and dramatic literature. Prerequisites: Spch. 122 and at least 8 hours of credit chosen from Spch. 241, 261, 262, and 264 or consent of the instructor.

325. AMERICAN THEATER HISTORY II. 4 HOURS. Development of the American theater from 1914 to the present; native and European influences in determining theatrical trends. Prerequisites: Spch. 122 and at least 8 hours of credit chosen from Spch. 241, 261, 262, and 264 or consent of the instructor.

328. PLAY PRODUCTION PROSPECTUS. 4 HOURS. Seminar; emphasizes the stage director's central function in creating an artistic concept for producing a play and coordinating all elements of performance in an aesthetic unity. Historical research of a recognized dramatic classic and preparation of a complete production book. Prerequisites: Spch. 251, 264, and 265 or consent of the instructor.

329. THEATRICAL CRITICISM. 4 HOURS. Seminar in the study and practice of theatrical criticism, principally modern and contemporary criticism. Historical bases of critical judgment of play and performance; function and influence of the critic in establishing artistic standards and cultivating public taste. Preparation of criticisms of current productions. Prerequisites: Spch. 122, 123, 261 and 264 or consent of the instructor.

331. MASS MEDIA PROGRAMMING. 4 HOURS. Mass media program types, objectives, methods, and effects; creative development of programs from conception to script. Prerequisites: Two courses in speech including Spch. 232.

333. MASS COMMUNICATIONS SEMINAR. 4 HOURS. Intensive study of the nature of mass media in contemporary society. The legal and social responsibilities of mass media institutions in the United States and abroad. Prerequisites: Two courses in speech including Spch. 131.

334. WORLD BROADCASTING. 4 HOURS. The broadcast systems used by the nations of the world; alternative and "mixed" systems; international organizations, agreements, exchanges, and problems; broadcasts to and from other countries; implications of such new developments as satellites; mass and nonmass uses. Prerequisites: Spch. 113, 131, and 231 or consent of the instructor.

351. SCENE DESIGN AND LIGHTING. 4 HOURS. A lecture-laboratory approach to the role of stage lighting in scene design. Analysis of historical background and sources; special emphasis on such areas as theories, psychological and aesthetic factors, and lighting application techniques and equipment. Lectures, readings, and practical problems. Prerequisite: Spch. 251 or consent of the instructor.

354. THE PSYCHOLOGY OF LANGUAGE. 4 HOURS. Same as Linguistics 374 and Psychology 354. Introductory survey of methods, theory, and research; the history and present status of psychology's interest in language behavior. Prerequisite: Consent of the instructor.

361. PERIODS AND STYLES OF ACTING. 4 HOURS. Concentration on premodern styles of acting from these periods: classic Greece, *commedia dell' arte,* Elizabethan, Restoration and the eighteenth century, nineteenth century melodrama, and naturalism. Prerequisite: Spch. 262 or consent of the instructor.

371. ADVANCED STUDY OF LANGUAGE. NO CREDIT. Intensive study of the language and speech activities of elementary school children; particular attention to language-disabilitied children. Includes the study of language acquisition and applicable speech activities. Prerequisite: Baccalaureate degree from an accredited institution.

372. INSTRUCTIONAL APPLICATIONS OF TELEVISION AND RADIO. 4 HOURS. Television and radio as instructional communications media; the design of instructional materials relating the communications requirements of subject matter to communications capabilities of television and radio; production, utilization, and evaluation of instructional television and radio presentations. Prerequisites: Spch. 131 and two courses chosen from Spch. 231, 232, 233 or consent of the instructor.

374. MEDIA INTERNSHIP. 4 TO 12 HOURS. Media communciation studies in a field setting. Students work in an approved professional field setting to investigate the uses of appropriate and relevant electronic media. Problem-solving approach; individual projects developed through conferences with a University faculty member and a department-selected field supervisor. Prerequisites: Spch. 233; consent of the department head must be obtained one quarter in advance.

380. ETHNOGRAPHY OF COMMUNICATION. 4 HOURS. Social interaction viewed in terms of its context. The role of the investigator as participant-observer. The taxonomic method of description and analysis. Focus is on urban contexts. Prerequisite: Spch. 181 or consent of the instructor.

397. PROSEMINAR IN SPEECH AND THEATER. 4 HOURS. Examination of research trends and methodologies appropriate to the area. Prerequisites: Graduate standing and 30 hours of credit in speech and theater.

SPEECH FOR FOREIGN STUDENTS (SpchF)

103. SPEECH FOR FOREIGN STUDENTS. 4 HOURS. Sounds and intonation patterns of American English; relation of sound to spelling. Drill sessions designed to improve the student's ability to speak and understand English at normal conversational speed. Prerequisites: Reading knowledge of English; ability to understand instructions.

104. SPEECH FOR FOREIGN STUDENTS. 4 HOURS. English pronunciation for students whose native language is not English. Sounds and intonation patterns of American English; designed to improve the student's ability to speak at a normal conversational pace. Pronunciation material similar to that in Speech for Foreign Students 103 but for more advanced students. Prerequisite: SpchF. 103 or consent of the instructor.

STUDENT COUNSELING SERVICE (SCS)

101. READING IMPROVEMENT. NO CREDIT. For students who wish to increase their reading rate or improve their vocabulary and comprehension skills.

102. STUDY SKILLS IMPROVEMENT. NO CREDIT. For students who need to develop more effective study methods. Through discussion and group interaction, students are helped to clarify their purposes and goals and to improve concentration and study skills.

103. VOCABULARY DEVELOPMENT. NO CREDIT. For students who need assistance in developing language skills. Use of vocabulary in thinking and communication. Practical exercises in vocabulary building.

104. CAREER PLANNING. NO CREDIT. For students who wish to clarify their vocational goals. Self-evaluation of abilities, interests, and personal needs as they bear on occupational choice.

105. GROUP DYNAMICS. NO CREDIT. Group sessions for students who wish to develop greater awareness of themselves and their relationships with others and to become more sensitive to nonverbal forms of communication. Groups oriented toward specific topics, such as leadership training, are offered if a sufficient number of students express interest.

180. READING AND STUDY SKILLS IMPROVEMENT. 0 HOURS. Restricted to students enrolled in the Educational Assistance Program in Urban Education and to students enrolled in the Native American Program. Improvement of reading comprehension in relation to different types of content; understanding the processes of concentration, retention of ideas, memory, and distribution of practice. Intensive application of improved methods of reading and study; elimination of ineffective approaches. Prerequisite: Consent of the instructor.

SWAHILI (Swa)

101. ELEMENTARY SWAHILI I. 4 HOURS. Four additional half hours per week in the language laboratory. Reading, grammar, and simple oral practice.

102. ELEMENTARY SWAHILI II. 4 HOURS. Four additional half hours per week in the language laboratory. Prerequisite: Swa. 101 or the equivalent.

103. ELEMENTARY SWAHILI III. 4 HOURS. Four additional half hours per week in the language laboratory. Prerequisite: Swa. 102 or the equivalent.

104. INTERMEDIATE SWAHILI I. 4 HOURS. Two additional half hours per week in the language laboratory are required. Prerequisite: Swa. 103.

105. INTERMEDIATE SWAHILI II. 4 HOURS. Continues Swahili 104. Two additional half hours per week in the language laboratory are required. Prerequisite: Swa. 104.

106. INTERMEDIATE SWAHILI III. 4 HOURS. Continues Swahili 105. Two additional half hours per week in the language laboratory are required. Prerequisite: Swa. 105.

SYSTEMS ENGINEERING (SysE)

150. GRAPHICAL METHODS. 2 HOURS. Principles of multiview graphical representations, pictorial graphical representations, graphical data representations, and introduction to computer graphics. Discussion and laboratory. Prerequisite: Registration in Comp. 101 or consent of the instructor.

151. INTRODUCTION TO ENGINEERING DESIGN. 4 HOURS. Fundamentals of engineering design processes; engineering graphical problem solving and communications; data presentation and analysis; vector analysis; technical reports;

standards and conventions; spatial geometry; short creative problems and creative design projects. Prerequisite: Registration in Math. 130 and Comp. 101 or consent of the instructor.

153. INTRODUCTION TO ENGINEERING DESIGN. 4 HOURS. Practical applications of design strategies and modeling and analysis techniques to engineering systems design projects; introduction to a variety of fundamental analytic methods, such as optimization, probability and statistics, and simulation; consideration of the role of the professional engineer in society. Prerequisites: SysE. 152, Comp. 102, and registration in Math. 132 or consent of the instructor.

155. PRINCIPLES OF SYSTEMS ENGINEERING I. 4 HOURS. Definitions and attributes of a system, survey of existing techniques for system modeling and decision making, feedback and stability of systems, man-machine systems. Laboratory. Prerequisite: Concurrent registration in Math. 130.

221. GRAPHICAL CALCULATIONS. 3 HOURS. Graphics in space flight. Graphical analysis and computations with analytical proofs. Graphical mathematics, including graphical calculus. Graphics of empirical equations. Graphics in communications—technical charts and nomographs. Conceptual and creative design and computer-related graphics. Prerequisites: SysE. 103 or the equivalent and registration in Math. 133.

222. SURVEYING I. 4 HOURS. Fundamental operations. Prerequisite: Math. 250.

223. SURVEYING II. 4 HOURS. Introduction to precise control surveys and route alignment; elements of aerial photogrammetry. Prerequisite: SysE. 222.

225. PRINCIPLES OF SYSTEMS ENGINEERING II. 3 HOURS. The modeling approach to systems analysis, detailed description of a few specific modeling techniques, general approaches to the analysis of large-scale systems. Prerequisites: SysE. 155 and concurrent registration in Math. 131.

289. COOPERATIVE ENGINEERING PRACTICE. 0 HOURS. Same as Energy Engineering 289, Information Engineering 289, and Materials Engineering 289. Off-campus participation in a government or industrial training program. Prerequisite: Enrollment in the cooperative engineering program.

290. COOPERATIVE ENGINEERING SEMINAR. 1 HOUR. Same as Energy Engineering 290, Information Engineering 290, and Materials Engineering 290. Lectures and seminar for students in the cooperative engineering program. Prerequisite: SysE. 289, taken during the previous quarter.

307. CYBERNETICS I. 4 HOURS. Same as Information Engineering 307. Introduction to artificial intelligence and pattern recognition by computer. Programs for playing games, proving theorems, answering questions, and making medical diagnoses. Property selection and decision-making techniques. Prerequisites: Math. 195 and either 250 or 370 or consent of the instructor.

315. DYNAMIC SYSTEMS ANALYSIS I. 4 HOURS. Mathematical modeling of systems described by ordinary differential and difference equations with application to engineering and socio-technological systems. Matrix transfer function forms for interacting systems. The Laplace and Z transform methods as applied to specific problems. Solutions for elementary topologies using computer simulations as laboratory experiments. Prerequisites: InfE. 210, Math. 195.

316. DYNAMIC SYSTEMS ANALYSIS II. 4 HOURS. Computer and analytical modeling of inherently or topologically nonlinear socio-technological systems. Stability analysis. Systems with transportation delays. One- and two-dimensional distributed models. Laboratory simulation of particular systems. Prerequisite: SysE. 315.

335. URBAN SYSTEMS I. 4 HOURS. Transportation in metropolitan areas, application of the systems approach to transportation, urban development forecast models, urban transportation forecast models, data collection procedures for determining urban travel behavior. Prerequisites: SysE. 342 or Soc. 185 or basic statistics, Econ. 120 or 321, and Math. 112 or the equivalent.

336. URBAN SYSTEMS II. 4 HOURS. Analysis of techniques used in urban systems engineering; emphasis on urban transportation systems and evaluation methodologies for selection of alternative urban system designs. Prerequisites: SysE. 335, 345, 371, and QM 370.

337. URBAN TRANSPORTATION MODELS. 4 HOURS. Specific models used in urban transportation studies; structuring transportation model sets including data management needs and legal constraints. Prerequisites: SysE. 335, 345, 371, and QM 370.

338. URBAN TRANSPORTATION SYSTEMS PLANNING. 4 HOURS. Evolution of transportation planning in the United States, major transportation planning studies and their methodologies, continuing planning studies, additional planning models. Term planning project. Laboratory. Prerequisites: SysE. 337 and QM 371 or consent of the instructor.

340. ANALYSIS AND DESIGN OF SYSTEMS I. 4 HOURS. Open to a limited number of advanced undergraduate and graduate social science students. Introduction to strategic and tactical procedures for applying a variety of analytic techniques to large-scale systems; emphasis on the interaction of these systems with society. In addition to readings, lectures, and discussions, student teams undertake comprehensive design projects to gain realistic experience with analysis and design procedures. Prerequisites: Senior standing in engineering and consent of the instructor. For social science students; senior standing in their fields, background in algebra, geometry, and calculus equivalent to Math. 110 through 112, and consent of the instructor.

341. MAN-MACHINE SYSTEMS. 4 HOURS. Specific system areas in which the role of man in the system operation requires a systematic analysis of the human component in the system. Examination of the critical concepts, variables, and techniques involved in optimum design of human operated systems. Laboratory experiments on man-machine interactions. Prerequisite: SysE. 315.

342. EXPERIMENTAL DESIGN. 4 HOURS. Fundamental concepts of statistical analysis. Introduction to standard experimental designs and their associated application in the statistical interpretation of research data and design of engineering systems. Completely random designs, randomized block designs, Latin squares, covariance analysis, and factorial experience. Prerequisites: Math. 195 and 220.

345. MODELING IN SOCIO-TECHNOLOGICAL SYSTEMS. 4 HOURS. Theory and practice; static and dynamic systems, continuous and discrete models, stochastic and deterministic modeling, principles of mega-systems. Simulation laboratory. Prerequisites: Math. 220 and SysE. 225.

350. STOCHASTIC PROCESSES. 4 HOURS. Description and analysis of probabilistic systems; recurrent event models, Markov processes, and queueing systems; digital computer simulation of stochastic processes in socio-technological systems; applications to specific engineering systems. Prerequisite: SysE. 342.

365. INDUSTRIAL ENGINEERING METHODS. 4 HOURS. Structure and theory of industrial organization; sales forecasting; investment analysis; plant layout and materials handling; methods analysis; work measurement systems; wage incentives and labor relations; industrial planning and policy development. Prerequisite: SysE. 342 or consent of the instructor.

366. INDUSTRIAL ENGINEERING CONTROLS. 4 HOURS. Microanalysis of industrial processes; quality control; inventory theory; production planning and control; man-machine scheduling models; assembly line balancing; reliability models. Prerequisite: SysE. 342 or consent of the instructor.

371. OPTIMIZATION TECHNIQUES I. 4 HOURS. Linear programming models, simplex methods, sensitivity analysis, transportation problems, duality. Nonlinear programming models, separable objective function, geometric programming, Kuhn-Tucker equations, quadratic programming. Prerequisites: Math. 195 and 220.

372. OPTIMIZATION TECHNIQUES II. 4 HOURS. Dynamic programming. Optimal control theory; Bellman, Hamilton-Jacobi, and Euler-Lagrange equations; Pontryagin's maximum principle. Applications of optimization techniques to socio-technological models and engineering systems. Simulation laboratory using examples of actual systems. Prerequisites: Math. 195 and 220.

373. OPTIMIZATION TECHNIQUES III. 4 HOURS. Determination of optimum strategies to solve probabilistic engineering problems. Use of random experiments to improve engineering decisions. Solution to multistage decision problems. Game theory. Prerequisite: SysE. 342.

380. QUANTITATIVE METHODS IN URBAN ENGINEERING. 3 HOURS. Theory and application of fundamental statistical and mathematical techniques of measurement and data analysis for urban systems engineering; presentation and critical review of selected quantitative methods appropriate to identifying problems, establishing design standards, and evaluating the performance of urban engineering systems. Prerequisites: Math. 195, 370 and SysE. 230 or 240.

391. SEMINAR. 1 TO 4 HOURS. May be repeated. Topics to be arranged. Prerequisite: Consent of the instructor.

393. SPECIAL PROBLEMS. 2 TO 4 HOURS. Special problems or reading by arrangement with the faculty. Prerequisite: Consent of the instructor.

396. SENIOR DESIGN I. 4 HOURS. Same as Energy Engineering 396, Information Engineering 396, and Materials Engineering 396. Introduction to engineering economics, legal and social constraints on design, safety and reliability theory, and the use of simulation and optimization techniques in the engineering design process. Prerequisite: Senior standing in the College of Engineering.

397. SENIOR DESIGN II. 4 HOURS. Same as Energy Engineering 397, Information Engineering 397, and Materials Engineering 397. Application of principles of engineering and engineering design methodology to the solution of a large-scale design problem. May be taken in any department, regardless of area of concentration. Prerequisite: SysE. 396.

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